Editorial Comment

Comments on a golden anniversary

In these uncertain days, when time-tried standards do not always hold true, there is apt to be a tendency to let tomorrow's problems be thought about tomorrow, rather than to make an effort to orient our thinking for long range accomplishment. Against this background an outstanding example of consistency becomes even more sharply defined than it would be at another time, and should serve us all in good stead in meeting our individual problems. We refer to the remarkable record of fifty years association with one organization . . . specifically to Frederick H. Leonhardt, president of Fritzsche Brothers, Inc. Fifty years is a long, long time. Mr. Leonhardt, we salute you.

Shippers are faced with growing paper problems

The problem of getting adequate paper supplies for containers is rapidly becoming one of the major headaches of this industry. Easing of restrictions on certain materials is encouraging, and promises an earnest for the future, but in the final analysis there is no net gain if the finished product is kept from the ultimate consumer through lack of shipping containers.

Cooperation on the part of the public, and of industry, in salvage operations is a patriotic and hard-headed necessity, but it is not a solution to the enigma.

We are faced with the plain fact that war is supremely wasteful, and paper is one of the sufferers. Vast quantities are used in shipping war goods overseas, where, once delivery is made, the container is totally lost for reuse. The possibility of supplying the civilian public, already serious, is getting much worse. The outlook is gloomy.

Large attendance expected at Flavor Manufacturers' meeting

What promised to be the most important meeting ever held by the Flavor Manufacturers is planned for May 22 and 23, at the Hotel New Yorker, New York, N. Y. The members' attitude toward this meeting may be gaged by the advance registration already in hand. It is the largest ever experienced in the organization's thirty-five year history.

the American Perfumer and ESSENTIAL OIL REVIEW

COSMETICS · SOAPS · FLAVORS

EST. 1906

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R. M. FOWLER, *Managing Editor*

MAISON G. deNAVARRE, PH.C., B.S., *Technical Editor*

WILLIAM LAMBERT, *Business Manager*

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desiderata

Comment on interesting new chemical developments and their application to cosmetics and toiletries.

by MAISON G. DeNAVARRE

REMOVING OBNOXIOUS SMELLS

Almost ten years ago, the problem of removing bad smells from the air and hands was the subject of an extended discussion and development on the part of one of my clients. It seems that the odors most obnoxious to man are the smell of onions on the hands and breath, garlic likewise, cooking cabbage or cauliflower, after odor of cigarettes and the smell of bodies in congested and small places as in busses, shelters and on trains. These odors are extremely persistent. The result of my client's work brought forth a cream that could be used after exposure to onions and garlic, removing the last traces of the odor. I don't know what happened to the company for they don't seem to be around anymore. As I look at it now, it was a good idea but with limited application. The average housewife either has learned to tolerate the smell of onions on her hands or she doesn't use them or she doesn't care if they do smell.

But the larger problem of deodorizing the air is of wide concern and offers a considerable field for enterprise. Two types of successful products are in use. One is the well known perfumed type of theater spray and the other is the wick type of deodorizer.

As everyone knows, the basis of an effective theater spray is formaldehyde. Other *reducing* agents, using the chemist's parlance, are probably just as effective. But formaldeyhde is available, it is cheap and its inherent dangers are pretty well known. It does the job, especially if the air is slightly moist. Perfumes have been developed that will blend with it. It is a good starting point for work in this line. Try a sample made from 4 ounces of formaldehyde (40%) with perfume and water. Spray or allow to evaporate from a wick. If you want something stronger, adjust the formula. For a novelty, paraformaldehyde being a solid, might suggest some unusual approach to the problem. All of which makes me wonder how one goes about to get a molecule of chlorophyll to evaporte into the air when it isn't volatile in the usual sense of the word, even though the idea has been covered by letters patent. Maybe someone can explain it.

M. G. DeNavarre at work in his laboratory

OLD vs NEW FORMULA

Shall a product formula be changed if the formula is a successful one? By change is meant, bringing it up to date, or balancing the composition for greater stability, or in some other way attempting to make it better.

Manufacturers who consider themselves as being modern and up to date don't usually like to mess around with successful formulas. The more open minded of them have usually insisted on a couple of years of researching with composition first, and consumer tests second. By that time the idea was discarded because it was old. And on it went.

Rarely a month goes by but that I come in contact with a product that is poorly formulated even though successful. The question inevitably comes up regarding changes. My own feeling being that no matter how successful, changes should be made if they will better the product. Sometimes the changes must be made because of shortage of raw materials in a warring world. Such changes cannot be allowed to take a couple of years of testing. Snap judgments must be reached while the substitute materials are still available, or they too may be impossible to get.

Analyzing successful products, it is surprising to find that many were launched with no real expectations of prosperity. But once the product is up on top, the *"let's take a chance"* feeling quickly fades and in its place comes a feeling of *status quo*. Even the wisest business man will admit that "nothing ventured nothing gained" but he believes that policy to be good for the other fella and not for him.

There just is no product yet developed or sold that cannot be made better in some way or other. If you can remember that, your own products may profit immensely.

MAINTAINENCE EQUIPMENT

A lot of manufacturers are in need of new equipment (to replace worn out equipment) or of parts to keep old equipment properly repaired. The W.P.B. in your district should be consulted. You may surprise yourself at how cooperative they are in this line. If you need replacements, GO to W.P.B. at once.

LEG MAKE-UP APPLICATION

One of the major drawbacks in the use of leg make-up is the messy job of applying it. Labels advise that the

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product be shaken well before use, poured into the palm of the hands, then applied to the leg, starting with the toes and on up.

Wouldn't it be simpler to use a sponge? I've seen a sponge used a lot of times and it works well. The hands are hardly soiled. The application is surprisingly smooth. Rubbing down with a dry towel or cleansing tissue further makes a neater job. Try it!

ALIEN PATENTS

It was mentioned in this column some time ago, that the Office of Alien Property Custodian in Chicago was preparing abstracts of alien patents. These are now available. Looking through the list of 24 patents under this heading, only a few of them bear noting, and they are: a skin protective paste; stable p-phenylenediamine hair dye powder; perfume fixative consisting of ethers of mono, di or trihydric alcohols and alcohols with 8 or more carbons; solidifying some normally liquid substances such as glycerine; and a soapless shampoo. The others are just patents. If you are interested in any, I'll be glad to give you the numbers of the patents mentioned. As you know, the fee for getting a license from the Alien Property Custodian is only $15.00 now.

New Dentifrice

A man has just showed me a novel idea in a dentifrice. It gives the same amount each time, has all the desirable properties of a powder and paste, offers no problem in packaging and is a form of dentifrice that has never before been offered. There is a patent application being made, but meanwhile he would like to contact interested large companies who would like to get into this field. Write to me and I will put him in touch with you. The idea seems pretty good. It works well indeed. It is an unusual approach to the dentifrice problem.

TAXING PROTECTIVE PRODUCTS

As I go around the country, manufacturers of protective preparations (for use in Industrial plants to prevent industrial ailments) tell me that the Collector of Internal Revenue is trying to collect a 20% tax on these products.

If a jar of protective cream is a cosmetic, I'll eat my shirt. It is no more a cosmetic than a pair of gloves or a face mask. It simply protects. THERE SHOULDN'T BE ANY QUESTION ABOUT IT. If I were such a manufacturer, I'd not pay it until glove makers paid a 20% cosmetic tax. Let them bring suit. A cream protective is strictly speaking a device. It happens to be called a cream, so I suppose the Treasury Department figures they are cosmetics. But how about shoe cream? Or silver cream?

QUESTIONS AND ANSWERS

500 LIQUID WETTING AGENTS

Q.: I used to use sodium lauryl sulfate in a liquid skin cleanser, but I cannot get this material any more. Will you tell me if there is another material that we can use as a substitute, and the name of the people who sell it. T. Y. Indiana.

A.: Practically all effective wetting agents in dry form are non-existent. There are a number of liquid wetting agents that can be used, and we are sending you the names of the suppliers under separate cover. In addition, please consult Replacements Bulletin No. 12, which has just come off the press. Inasmuch as you do not give us much information as to how you use this ingredient, it is impossible for us to give you as much help as we would like to.

501 SATURATED FATTY ALCOHOLS

Q.: I have been going over deNavarre's book, The Chemistry and Manufacture of Cosmetics, *and came upon the following: saturated and unsaturated fatty alcohols, oleyl alcohol, isopropanolamine oleate, methyl & ethyl linoleates and propylene glycol laurate. I am in need of an item like isopropanolamine for making an emulsion hair tonic containing mineral oil and water. The product I am now making with triethanolamine is not what I want it to be, and I hope that isopropanolamine will make a better product.* L. B. New York.

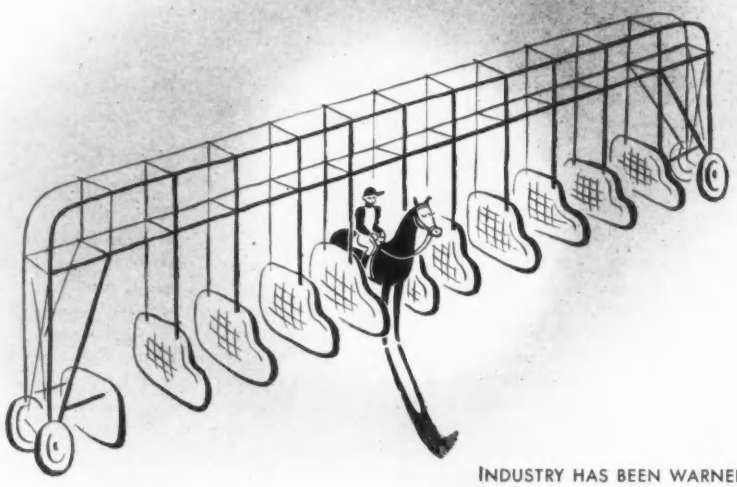
A.: The supplies of the various ingredients you are interested in are being sent you under separate cover. The saturated fatty alcohols are used to give special effects in cosmetics. The best one is cetyl alcohol which is used in amounts ranging from ½ to 2%. It also aids in emulsification. The unsaturated fatty alcohols are solvents for bromoacid and are alcohol-soluble for use as in hair dressings. Isopropanolamine oleate has to be made, since only the amine is sold. It is used by taking equivalent weights of each material. You will find the equivalents in deNavarre's book, which you already have, by looking on page 249, table 38. Methyl and ethyl linoleates have also been called "vitamin F." They have a certain skin effect when used in proper concentrations if the particular individual is deficient in these unsaturates. Propylene glycol laurate is an emulsifying agent producing emulsions of the oil-in-water type, having an almost neutral pH. Whether these materials will work in your hair dressing is difficult to say because you have not only the problem of formulation but also one of manipulation.

502 KARAYA GUMS

Q.: We are subscribers to the American Perfumer *and are sure that you can be helpful to us with formulas for wave set and hair dressing of transparent type. We have been advised that karaya gum is the ingredient usually used, but would like to know if there is something better. Your formulations will be greatly appreciated.* R. A. California.

A.: It is true that karaya gum is the most popular ingredient for wave sets. It is cheap and produces a nice stringy product. It is usually used in combination with borax and in concentrations of approximately ½ to 1% of the gum. Of course other gums beside karaya can be used but they are expensive and, with the exception of quince, they do not produce nearly as good results. Quince, however, is undoubtedly the best waving material, but it is hard to get today, and its solutions are comparatively thin. From ¼ to ½% mucilage of quince seed is an excellent starting point, suitably preserved. You do not tell us any more about your hair dressing, and it is an open question as to which type you are interested in. The alcoholic type consists of 20% castor oil in alcohol suitably perfumed. Many hair dressings consist of nothing more than mineral oil or mixtures of mineral oil with vegetable oil, suitably colored and perfumed. More recently, the emulsified type of hair dressing has made its appearance on the market. This product is either of the water-in-oil type or of the oil-in-water type of emulsion, depending upon the maker. We would suggest that you start your work by using a formula for cold cream and doubling up on the amount of water. Thus, if the cold cream consists of beeswax 10 parts, mineral oil 50 parts, paraffin wax 5 parts, spermaceti 6 parts, borax 0.7 parts, water 28.3 parts, double up on the water and use 56.6 parts water or even more, depending upon the degree of oiliness and the consistency you desire. As for the water type of hair dressing, the water-in-oil type, this is extremely difficult to produce under the best conditions and all we can offer as a suggestion is that you use the standard absorption base cream formula replacing solid materials with mineral oil and emulsifying.

DONT BE LEFT AT THE POST-WAR PLANNING



INDUSTRY HAS BEEN WARNED by Jesse Jones, U. S. Secretary of Commerce, that the war may end suddenly and business should, therefore, be preparing now for the Post-war period.

The Committee for Economic Development reports that cessation of hostilities in Europe will release 80% of the nation's war production capacity for reconversion for civilian use.

Mr. Jones' warning and the report of the Committee for Economic Development should serve as a double spur to all Post-war thinking. When restrictions are lifted from war-prioritied cosmetic ingredients, don't be caught flat-footed and left at the post.

The merchandising, packaging and production experience and facilities of Allied Products may be a source of guidance at this time for the all-important, fast get-away and quick sales pick-up when war production barriers are raised. Arrangements for consultation can be made at your convenience, and without obligation, at your office or at the Allied Office in the R.C.A. Building in New York City.

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Emulsions, Emulsification, and Emulsifying Agents

First of a series of articles discussing recent developments in the field . . . Preparation of oil-in-water and water-in-oil emulsions, new trends and discoveries

by LOUIS T. MONSON

IN THE LATTER HALF of 1943, the AMERICAN PERFUMER published a series of articles which set forth some general principles regarding emulsions and also some applications in the flavor and other industries. The present paper will not repeat that material except to the extent that repetition is necessary. Rather, it is intended to discuss some of the developments in the field of emulsions, emulsification, and emulsifying agents that have become known since the work was done on which the above-mentioned articles were based.

EMULSIFYING AGENTS

Emulsions are systems in which one liquid is distributed or dispersed in another and immiscible liquid, in the form of minute particles or drops. The liquids may be referred to as "water" (which includes water solutions and all other aqueous media) and "oil" (which term embraces all liquids not aqueous in nature). While viscosity and other factors may act to stabilize emulsions of one type of liquid in the other, the primary requirement for emulsion stability is an emulsifying agent of suitable character, present in sufficient amount. A given oil and a given water may be processed to produce a water-in-oil emulsion or an oil-in-water emulsion, or even to invert from one type to the other under changing conditions of temperature or other variables. Water-in-oil and oil-in-water emulsions are distinctly different in character and properties. Obviously the developments in the field of emulsifying agents must be held to be extremely important, and deserving of some attention in the following paragraphs.

EMULSION STRUCTURE

Little need be said about the basic principles of emulsion structure or emulsion preparation, because these seem not to have been materially altered by recent work in the field. At the same time, some statements are desirable, to furnish a foundation for later discussion. The general picture of an emulsion is that the dispersed liquid or dispersed phase of the emulsion, i.e., the liquid which is present in the form of small drops distributed throughout the other liquid or continuous phase of the emulsion, is prevented from coalescing into larger drops and separating to the bottom or the top of the containing vessel because of the disposition of the emulsifying agent.

The latter, because of its character, is not truly soluble in the sense of comprising simple molecules or simple ions in either the aqueous liquid or the oily liquid. Instead, it is at most only colloidally dispersible in one or the other of the liquids. Because the molecules of the respective liquids have greater attraction for each other than for this interloper, the molecules of emulsifier tend to be excluded from the body of the liquid, and therefore eventually some of them (not all) find themselves disposed at the boundary surface between the liquids. If the emulsifier is essentially water-dispersible or water-wettable, it is very largely to be found on the water side of this boundary or interface; if it is oil-dispersible or oil-wettable, it is present largely on the oil side. But, in either case, it is in time in part forced to take up such intermediate position, which phenomenon is referred to as positive adsorption. To the extent they are so adsorbed, the particles of emulsifying agent act to lower the interfacial tension at the boundary between the liquids.

INTERFACIAL TENSION

Interfacial tension is the property possessed by the boundary or interface between two immiscible liquids, which corresponds to the better-known surface tension existing at the boundary between a liquid and air. Surface tension is recognized by the tendency of a liquid to form drops, with high-surface-tension liquids forming larger drops under given conditions than do low-surface-tension liquids. Interfacial tension may be thought of as a tug-of-war at the boundary between the liquids, each of which is attempting to form droplets of its own at the same time, by virtue of a pull on the surface molecules exerted by the interior or body of the liquid. In general, the liquid with the lower surface tension comprises the continuous phase of the emulsion. Low interfacial tension, while insufficient alone to produce a stable emulsion, is important in facilitating the dispersion of the liquids.

SEPARATION OF PARTICLES

The situation may be visualized by comparing the film or aggregation of emulsifying agent particles in the interface to a child's balloon. If the balloon is filled with water or oil and immersed in a container of the other liquid, it constitutes on a highly magnified scale the counterpart of an emulsion particle. If two such balloons are so suspended, the liquid they contain does not run together to form one larger "drop" when they are brought close together, because of the presence of the film. If it were not present, the smaller drops would be squeezed into the larger drops by virtue of their higher internal pressures (a phenomenon easily demonstrated with two drops of mercury of different sizes). Where the drops in an emulsion approach each other closely, electrical forces, solvation effects, etc., act to keep them apart.

BEHAVIOR OF AGENT

In addition to being forced to the boundary between the two liquids by the forces of cohesion acting in the respective liquids, the particles of emulsifying agent do not assume random positions there, but become oriented in a definite manner. For example, in the surface of a solution of ordinary soap in water the soap particles align

themselves so that the end derived from the lye used in making the soap faces the water, and the end derived from the fatty ingredient used in producing the soap sticks up into the air. If there were oily material afloat on the water surface, the conditions would approximate those present in an emulsion, and the picture would then show the oriented soap film with all its particles so oriented that a common end faces the water side of the interface and the other end faces the oil side. (Actually, the facts in the case of soap are not quite so simple; but they permit of the present illustration.)

Since, as stated above, a given oil and a given "water" may be used to produce either type of emulsion, water-in-oil or oil-in-water, the important fact is that expressed in Bancroft's Rule. This states, in effect, that if the emulsifying agent is preferentially dispersible in or wettable by one type of liquid, that liquid constitutes the outside or continuous phase of the finished emulsion. There are seeming exceptions to this rule, but the general principle is sound.

EMULSIFYING AGENTS EMPHASIZED

From the foregoing introductory discussion it will be apparent why newer developments in the field of emulsion formation have included and emphasized the discovery and utilization of many new emulsifying agents. This has been the case, with the added thought that some of the developments have contemplated the preparation of materials which may be added to an already formulated emulsion to assist in its stabilization, although they alone are not recommended to produce the original emulsion. Whereas the emulsifying agents originally employed were comparatively simple in structure or else were natural products readily obtainable, the current interest is in highly complex synthetic compounds of the most varied kinds. Soap was for centuries a common emulsifying agent. Some 75 years ago, sulfonated vegetable and animal oils began to be used in its stead in many formulas, because of certain desirable properties or characteristics they possess which soap does not enjoy. Casein was used in many food preparations, as was albumen.

IMPORTANT NEW EMULSIFIERS

Today the emphasis is on what might be termed "soap substitutes" in the non-edible emulsion field; and even in the food emulsion field emulsifying agents of unusual composition are being employed. (The production of a non-spattering margarin, for example, has attracted investigators; and some of the solutions to the problem that have been made public through the medium of patents comprise highly complex synthetic organic chemical compounds.) One of the newer emulsifiers has been referred to as being "the most important and one of the best-known and most fool-proof materials to handle." New industrial chemical processes have made some such emulsifiers available in quantities and purities that could not have been envisaged even a few years ago.

METHODS OF PREPARATION

Emulsions are still prepared in time-honored ways, usually by simple stirring or by passage of the ingredients under pressure through restricted orifices or passages in pipes or homogenizers or colloid mills. In such instances, the liquids are both broken into myriads of small particles; but those of the one liquid are so affected by the emulsifying agent that they do not coalesce as readily as do the particles of the other liquid.

Consequently, the work of producing an emulsion goes to the subdivision of the liquid to be dispersed and the aggregation, on the surfaces of its drops, of the particles of emulsifying agent. The more vigorous the treatment, the more completely the liquid is reduced to drops and the smaller are the drops —and the more stable is the emulsion, under most conditions. Continuous agitation has an effect markedly different from and inferior to that of intermittent agitation in some cases.

SIMPLE EMULSIONS

Some emulsions are produced much more simply, in that they are spontaneously formed when a prepared oily liquid is merely poured into water (or a prepared aqueous liquid is poured into oil, if the desire is to produce a water-in-oil emulsion). This class of emulsions is of unusual interest in some respects. It frequently includes "transparent" emulsions, which have somewhat novel properties. This sub-class is of interest, for example, in the preparation of the soluble oils used in metal-cutting. Household disinfectants and deodorants are sometimes of this type; and subsequent investigation may bring other applications in other industries.

In most cases, emulsification technique may be said to have advanced safely beyond the point where formulas included the instruction to stir in a given direction to avoid failure (the thought once having been expressed that a left-handed person could not produce the emulsion in question); but much remains to be accomplished in this direction. A short discussion of more recent developments in the principles of emulsification is included below.

NEW DEVELOPMENTS

Certain properties of emulsions, such as color, consistency or viscosity, and stability to outside influences like temperature, have been investigated in recent time, or are of sufficient interest to merit inclusion in any discussion of the subject of emulsions. Also, in some cases, new tools have become available which have facilitated the study of such systems; and these should be mentioned at least in passing. It is hoped to present some thoughts on the various foregoing phases of the subject of emulsions, in the following paragraphs, illustrating the discussion by formulas chosen so as to offer the greatest interest to our readers.

(Editor's Note: This article will be continued in an early issue.)

New and important applications of black (ultraviolet) light. M. deBuccar. *Papeterie* **65**, *74-7 (1943.)*—After some uses of ultraviolet light and the fluorescence of various papers are discussed, the behavior of pulps is discussed: sulfate shows red-brown, unbleached sulfite bright violet, bleached sulfite yellow, unbleached soda brown and bleached soda rose-orange fluorescence. The pulps are colored with a 1:200 solution of Rhodamine 6GB for the tests. With brilliant dianil green young wood shows an azure and old wood a yellow-green fluorescence. The characteristic fluorescence with methylene blue, methyl violet, flavine, diazobrilliant yellow, etc. is discussed. (Through *C. A.* **38**, *1110, 1944.*)

5—Ketogluconic acid by fermentation of glucose. Joseph J. Stubbs, Lewis B. Lockwood, Edward T. Roe and George E. Ward (to the Secretary of Agriculture of the U. S. A. and his successors in office). U. S. 2,318,641, May 11. A glucose (or gluconate salt) soln. is inoculated with an active *Acetobacter culture*, aerated and agitated while cultivating the bacteria in a submerged state (suitably at 20-40°, under 30 pounds per square inch gage pressure of air for 30-50 hours). Several examples with details are given. (Through *C. A.* **37**, *6086, 1943.*)

The Gossiping Guide to the News

Effect of the new cosmetic tax on consumer . . . Beauty technique in the defense plant . . . Advertising an aid to foreign trade relations . . . Plastics and the future

by RAYMOND LYMAN

WHAT'S THE EFFECT of the new cosmetic tax going to be on the total volume of sales? A survey of leading stores, manufacturers and supply houses has just been made by Industrial Service. Easter-week sales were better than usual in spite of bad weather. Taxes on April 15 hit pockets already hurt but had no effect on the war-worker who buys just what she needs.

New packages in the drug stores caught the eye of passing shoppers. Salesgirls presented the new packages and induced sales of quality merchandise wherever possible. Some women rushed to lay in advance supplies before the tax went into effect. But, as in the case of the pre-liquor-tax rush, the preponderance of buyers purchase as they go and don't stock up.

To sum up: after the usual seasonal slump, shoppers will purchase what they want, as usual, with no attention to the tax.

EARLY CHRISTMAS PREPARATIONS

Christmas orders are in. Counter cards and window displays finished. Manufacturers need to prod store buyers into a like mood of advance Christmas ordering, instead of waiting until November 25th, as one large store did last year, before placing the Christmas order. Shortages of help are acute all down the line. More time is needed to get any supply need filled. As a whole, store personnel is about three years behind the times in its comprehension of trade difficulties. A few buyers are shining exceptions who plan and order ahead.

The manufacturers need to write specials ads for the trade papers. Stress the help shortage, the box shortage, the inability to get special bottles, the necessity for ordering ahead. The stores also need to co-operate in advertising which will carry the idea to the consumer that the perfume is delightful no matter what bottle it is in; that paper needs to be conserved, so carry your packages unwrapped, etc. Frankly, do you think the fuss about fancy containers is warranted? The consumers like a nice package, yes. But they're much more concerned with getting a product they like than they are about its method of packaging. The store buyers worry about the decrease in number of fancy containers and pass the idea on to the sales-people. Concentrate instead on the merchandise. Don't oversell or the trade will have to get along with less merchandise at some future date, a noted purchasing agent prophesied. Get your campaign of institutional advertising started at an early date.

MAKING FRIENDS FOR A WHOLE LINE

Many women are using cosmetics for the first time. Defense plants have introduced special protective creams for hands and faces. Little, carefully worked out booklets give additional tips on care of face and hands. Teaching basic care cannot be overemphasized. Every product which falls into the hands of these new users should be an introduction to other products as well as better skin.

Revlon's booklet, just off the press, gives eleven tips for a good manicure. Two gay sketches show the user taking dictation and shopping. Today's woman is busy. She is shown how to get a good, practical manicure, protect her hands, feed the cuticle and a color chart suggests the proper shade of face powder. That's good sound promotion.

Miss Diane Wheeler, who sent out the booklet, has a background of writing good common sense with a broad-base appeal. Revlon is fortunate to have her on their writing staff.

SPEED-UP

Taking a time-saving tip from the English, we now have many beauty parlors in defense plants. The women at home could use a speed-up, too. Mona Manet puts three or four attendants to work at once. The technique is interesting. One brushes the hair thoroughly, then cuts or dresses it. One does the face and neck; first circulation, then soothing creams. One speeds the manicure, smooths on protective creams. The fourth attendant kneads the back and feet, applying a circulation cream to rest tired muscles. Miss Manet believes the new time-saving method is here to stay.

PLASTICS OUTLOOK

Norton Laboratories right now are immersed in war products. But experimenters here and there are dabbling in shapes of the future. Transparent and opaque heavy and light, thick and thin. It's impossible to foretell what will be available when civilian output is again rolling. Designers everywhere show us fascinating plastic shapes. Their theme song might well be, "There's a Plastic World a-Comin'!" The plastic department of General Electric still produces lipstick containers of thermo-plastic. In between telephone calls, urbane E. W. Falk answered questions. Plating of plastics will be important in post-war developments. However, the working of gold or silver-leaf in a delicate design will be costly. The rolled leaf must be inserted by hand into the plastic moulds. But the possibilities for beautiful workmanship are endless.

For the average purse, a jeweler's handling of materials will bring plain cases, opaque and clear, colored and crystal, within the price range of all. Double-duty containers will zoom in importance.

EXPORTING GOOD WILL

A drive is soon to start, to better our export foreign relations. Americans have an excellent post-war market in prospect, but it must be nurtured. Have a clinic of good packaging in your plant. Inspect every package carefully before starting it on its long voyage. The package must withstand the most exacting demands. The British have built an excellent foreign trade by delivering goods unbroken and packed for climate and transportation of the remote spot to which the package may be consigned. Our clipper ships roamed the seven seas. Our boys today are learning languages and customs in many a potential trading-post, hoping to see our trade-routes re-established. Good merchandising, good packaging, merchandise delivered in good condition. The future of our merchant marine is up to each shipper, not the other fellow.

Bristol-Meyers believes in keeping up foreign advertising as a contribution to better foreign relations. Many foreign papers are dependent on your ads. From the purely selfish angle, if you let your trade-name disappear for several years, other countries will take over your hoped-for post-war sales. Your old customer must constantly be reminded how good your product is. What you can ship, pack for the roughest possible handling. Good-will can only be furthered when your customer receives the goods he's been waiting for in good condition, not with edges smashed or contents totally destroyed. See your packaging is done well enough for loaders to put a truck on top of it, throw it, drop it, soak it in sea-water or oil. That's good advice from old hands at the game!

TURNOVER

So many factories complained of labor shortages and turnover that I wondered how the cosmetic departments of the stores were making out. Miss Neva Bradley, of Daggett and Ramsdell's, had an encouraging report. The turnover has decreased sharply the last several months. The war brides have been replaced by older women who leave only when the family moves. She reports the older women take an interest in the customer's problems and are building substantial followings.

SUBSTITUTES SURPASS ORIGINAL

Miss Dorothy Nichols, of Primrose House, paid tribute to the researchers who diligently seek to replace scarce items. Some of the substitutes are proving so valuable, like the use of Apricot Oil for Sesame Oil, that when the originals are again available they won't be used.

The picture is a nostalgic note. Miss Nichols likes to remember when she

could get around to see "her girls" by plane and not be earth-bound by priorities!

SELF-MERCHANDISERS

Lehn and Fink find a self-merchandiser useful for their Hinds' Hand Cream and also for Etiquette, their appropriately-named deodorant. Both named articles are in small jars so the merchandise may be stacked for counter display. Their sales manager, V. H. Proskey, is swinging around the country and won't be receiving visitors at the home office again much before May 15.

YELLOW—THE COLOR PROBLEM

Malic acid being short, Tartrazine is short, too. Labor shortages add to the scarcity, for more hands would produce and pack more. Just to be contrary, the designers boomed yellow, it seemed. S. H. Ebert, of the Interstate Color Co., is haunted by yellow dresses, yellow in khaki uniforms, yellow in butter. He was more cheerful, however, at the movement of cargo out of the country. Sailings of exports have been very satisfactory lately. The color men are hopeful that South America will replace the Dutch East Indian trade losses. Warning to shippers: cargo space will be tight again shortly as ships are diverted to overseas invasion-cargoes.

PAPER SHORTAGE

The Richard M. Kraus Co. is working ahead on Christmas paper as best they can with the labor shortages. Only old accounts can be accommodated. But, like everyone else working on Christmas, they use one thing when another isn't available. Labels and papers will be gay, nonetheless. Use as sparingly as possible, please, and campaign vigorously for paper salvage! The shortage of skilled technicians is another problem here. They suggest, wisely, that the industry as a whole sponsor the training of young women so a new supply of technicians will be available. The experiment is too costly for a single firm to undertake.

INNOVATIONS IN BOXES

Miss Stern, of the Seaman Box Co., reports the availability of a new translucent package to take the place of the one gone to war. Intended for a combination package, it will hold lipstick and sachet or bottles of perfume, but nothing not already packaged. So the hunt for substitutes goes on!

The Stylecraft Paper Box Co. are helping their customers to select the most compact packaging possible. Little display value is lost as the customers understand the paper problem. Future shortages are impossible to foresee. Order far ahead and let the supplier work at the orders as he can get help and material, is their advice.

DEMAND FOR GLASS

The glass companies sounded out of breath. They can't keep up with the demand. And how they'd like the war to end so they can carry out some of the ideas they have in store for us. Meanwhile, please sell your customers on taking what bottles they can get and stop fussing if plain ones come through when fancy ones were ordered, they plead.

LANOLIN USES

Another cheerful note in the shortage gloom is sounded by N. J. Rohrbach of Botany Mills. A glance at the many uses of lanolin in war would make it seem hopeless that the toiletries should get any: neutral wool grease for rust preventatives, pharmaceutical use such as in adhesive tape, skin creams for healing war wounds, degras in leather tanning, a form in carbon paper, printing inks. So, from September until this month there was no allocation for cosmetics. But now next month promises an additional allocation. Mr. Rohrbach's got his fingers crossed but he believes the worst is over.

An interesting sidelight on the increase in toilet lanolin usage was given by F. Amerman of the Plexo Co. Defense workers found lanolin just what they needed for drying skins and in spite of withdrawing salesmen to conserve supplies, the company's sales tripled and quadrupled. So, there's a tremendous market awaiting rich creams as soon as lanolin is available again in any quantity.

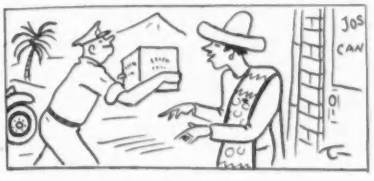
FORECAST FROM YARDLEY'S

Cecil Smith, president of Yardley's, weighs past experience against present problems and always comes up with the right answer. He predicts that lines will be shortened still further but that the public won't be pinched. Manufacturers will adjust, simplify further. His motto is, be flexible.

Dividing the production equitably is the unhappy task of sales manager Irving Godwin. Miss Helen Stansbury was given head of publicity for superb

copy with ideas and no burble. Art director Rico Capey's delightful packages make life more enjoyable for many weary workers, the while war-time substitutes are utilized to the fullest extent of their possibilities.

Select a good staff. Then let them alone. You've got enough on your hands to do your own worrying, says astute Mr. Smith.



President Schultz, of Shulton, is wracking his brains these days trying to find new products with which to occupy the many hands now doing war work. A house organ was inaugurated some months ago to get employees on their toes and thinking about what their machines can make, come peace. If everyone gets thinking along constructive lines, we may expect to see many new items in the future in addition to the fine-looking line of new perfumes already on the market.

GEOGRAPHY CLASS

To get a bird's-eye view of perfume possibilities, Dr. Ernest Guenther, Chief Research Chemist of Fritsche Brothers, Inc., was asked to do a little forecasting.

Ylang-ylang oil has been coming in from Madagascar but nothing else to speak of, in spite of the hopes after we occupied North Africa. French franc exchange is at such disadvantage with the American dollar rate, that although the traders want to sell, the price is prohibitively high in American dollars by the time the trader is enabled to secure any profit at all on the transaction.

Lovers of fine perfumes watched the campaign in Italy, with anxious eyes. Directly across from Messina, where so

much heavy fighting took place, is famed Calabria, whence comes the exquisite oil of Bergamot. Twelve years is needed to produce one of those sensitive trees.

Heavy earth-shock from guns, or earth pollution from war-gases might damage the trees irretrievably. This is a lesson in how world trade hinges on a particular section being by-passed by war. How destructive to the arts of peace are the arts of war!

While waiting for supplies to be restored elsewhere, Dr. Guenther has gone on an expedition which will take him to Panama, Mexico, Brazil and Columbia, to name but a few of the places where he will try and end the confusion over Jap mint. Plants will be examined carefully and he will try and discover the various species, methods of extraction, etc., in the production of the oil. Upon his return with authoritative material, we can look for much of the cloud to be dispersed.

He is also looking for sweet orange oil, tangarine oil, and oil of sassafras.

We envy him his trip and look forward to his report.

LOOK AHEAD

To those wise firms which always work as far in the future as possible, we can only say—keep it up. To the less-prudent ones, remember the parable of the Foolish Virgins who didn't supply their lamps with oil while there was time. And don't say we didn't warn you that Christmas is coming with a horn of shortages!

Toxicity of Aerosol-OT.—Aerosol-OT is the trade name for one of a series of surface active compounds having marked wetting and penetrating characteristics. It is the dioctyl ester of sodium sulphosuccinate. It has extensive applications in the textile industry, paint and ink manufacture, ore dressing, dry cleaning and photography. It is used for cleaning in bottling plants, dairies and canneries, and is also used in the cleaning and peeling of vegetables and fruit for packing. The compound has been recently considered as a possible ingredient in dentifrices pharmaceuticals and other products which might involve the absorption of small amounts by human beings and Bengalia et al, J. Ind. Hyg. and Tox., May, 1943, have reported their findings.

In order to determine the toxicity of this substance, 50 rats were given Aerosol-OT in their food in doses up to approximately 0.87 grams per kiligram per day. All of these survived a six month experimental period. Diarrhoea was occasionally observed in the animals on the higher doses. Neither the total red cell, total white cell, nor differential counts of rats was affected by continued administration. In a special experiment, however, a very transient shift in the differential count was observed, the enutrophils being increased at the expense of the lymphocytes. Three dogs receiving 0.1 gram per kilogram and three others receiving 0.25 gram per kilogram daily in their food remained in good health for six months. Three monkeys survived for six months the daily administration by stomach tube of 0.125 grams per kilogram. Aerosol-OT is somewhat irritating to the stomach, for in dogs and monkeys the administration of doses greater than 0.25 grams per kilogram and 0.125 grams per kilogram respectively generally resulted in prompt regurgitation. Two of five rabbits which received 0.5 grams per kilogram daily by stomach tube survived the full six-month period. The only manifestations of toxicity in those which died were anorexia and severe diarrhoea. Diarrhoea was also observed in the survivors from time to time. Gross and microscopic examination revealed no significant pathology in any of the animals which survived the full experimental period. If this experimental work can be considered applicable to man, it would indicate a low degree of toxicity. (Through *Chem. Prod.*, **6**, *76, 1943.*)

According to a report of the Canadian Toilet Goods Manufacturers Association, all restrictions on the purchase of glycerine have been abolished. Glycerine, as you can lay your hands upon it may be bought. Of course, there is no guarantee that the suppliers will be able to sell you as much as you wish.

Short Adages

by R. O'MATTICK

DURING THE SPRING SEASON we always receive a goodly number of 'poetical contributions' in our mail. These contributions are *welcome at all seasons of the year* if they have to do with matters concerning the art, science, headaches, business, gossip, government regulations, or anything else pertaining to perfumes or flavors, or allied to them or thereto or thereof, as the legal department would say.

* * *

We print herewith two such contributions. The first, a couplet by our lovely lady-friend, June Ippère, who is now an assistant in the purchasing department of one of the perfume établissements:

Oh, musk ambrette
I'll get you yet.

The other, we regard as quite a poetical effort and is from the pen of that noted perfumer, man of genius, man-about-town, raconteur, bon-vivant, and everything else—Dr. Rowmateral:

THE BALLADE OF EXTREMELY EXACTING EXPERIMENTS

(with apologies to François Villon)

I tried to make Eau de Cologne
With much water and little spirit,
But insoluble oils are like stone,
And cloudiness won't endear it.
Had I only Bois de Rose
Or Neroli or something near it—
But this stuff! Do you suppose
The Devil's own nose won't fear it?
Oh, give me an oil like patchouli
To dissolve in water like ice—
Then I could promise you truly
To make an odor that's nice.
But to use isopropanol!
(The stuff dissolves like a bubble.)
But it seems every living soul
Can readily *smell* the trouble.
Prince! You must have your smell
For the lovely lady who buys it!
And I have to work like hell
Till someone likes it who tries it.

* * *

There was a time, and we are not too old to remember it, when those charming, hard-boiled souls, yclept purchasing-agents, greeted all callers coldly and bid them goodbye lustily, as said callers backed out sheepishly with a threat to call again next week.

Our own friend and frequent contributor to this column, Mr. A. Goodbuy, was such an one among the battalion of buyers. In fact, for a long period of time we were not certain whether his name was spelled 'Goodbuy' or 'Goodbye.' He was far better at saying Goodbye than at making a good buy—but this is a parenthetical statement which may even be deleted by the Editor, who has to be careful about the feelings of those who read the ads in THE AMERICAN PERFUMER—and those who know readers who do.

"He says he's a cross-country hiking champion in 4-F and he's had sales experience!"

* * *

As we were saying, we didn't know exactly how to spell his name but we did know that many purchasing agents are very touchy about the correct spelling of their names. We settled the matter by addressing him as Dear A. G. when we wrote letters to him, thanking him for allowing us to leave a sample of Vetivert Oil or giving us an opportunity to quote on Hydroxy or things like that, which in those far-off days were as obtainable as mud in the Mississippi on an unusually muddy day.

But other days have come upon us and upon Mr. A. G., too. Now we note that he and his fellow purchasers say 'hello' to all callers lustily and 'goodbye' softly, sorrowfully and weakly. We trust this polite and laudable practice will continue long after the war is over, and when once again vetivert and hydroxy and every other oil and oxy and container and color and metal will be as plentiful as mud in the Mississippi.

* * *

One of the experts in flavoring materials pointed out that a flavor man has two things to worry about—taste and odor, whereas a perfumer is only concerned with odor.

True, says Pat Chouli, but while there are only five kinds of tastes (sweet, salty, sour, spicy and bitter) with modifications—there are an infinite number of odors with an infinite number of modifications. We, ourselves have seen at least 5,000 modifications of Numero 5, and no two alike.

A perfumer has only to smell an odor, or at worst, rub it on his skin to see if any odor or skin remains. But a flavor man has to taste his creations. Nevertheless, we would rather drink a quart of nearly any concentrated flavor than smell one dram of some of those rose oils which are supposed to have just come off the boat.

* * *

To the ambitious copy man AAA may mean Apply Advertising Appeal and to the wary perfumer, may his days be long, Always Age Ambergris.

Retail sales in cosmetics added up to $594,000,000 in 1943. The average woman worker is spending $2.37 every month on cosmetics according to a sampling survey concluded by WPB.

INFRARED SPECTROSCOPY. R. Bowling Barnes, Robert C. Gore, Urner Liddel, and Van Zandt Williams. Illustrated and indexed, 236 pages. Reinhold Publishing Corporation, New York, N. Y. Price $2.25.

A well-written work on the industrial application of infrared spectroscopy. The book contains qualitative and quantitative analysis procedures, an extensive library of reference curves, and an exhaustive bibliography.

Technical Abstracts from Scientific Literature

These brief abstracts listed provide a convenient key to current scientific literature of the world on perfumes, cosmetics, toilet preparations, soaps and dentifrices

Increasing the Stability of Hand Creams and Similar Preparations. Ger. 718,756, Feb. 26, 1942 (Cl. 30 h. 13.01). Prepns. contg. wool fat or its components are stabilized by adding 0.005-0.0005 of elemental I.

Cosmetic Coloring for the Hair and Skin. U. S. 2,320,098, May 25, 1943. A nontoxic colored coating material is used comprising at least 50 per cent of sucrose, lactose, dextrose or maltose together with 2 per cent or more of zein or gelatin and at least 10 per cent of water-insoluble pigment material, such as a metal oxide or pigment lake; and various auxiliary substances are mentioned which may be used.

Hair Tonic. Ger. 726,665, Sept. 10, 1942 (Cl. 30h. 13.06). The preparation consists of quaternary ammonium salts of esters derived from aminocarboxylic acids and high-molecular aliphatic substituted and (or) unsubstituted alcohols. (Through *C. A.* **37**, *6414, 1943.*)

Sweat as Bactericide—It having been shown that sweat may have some fungicidal properties, investigators continued the study of the antibacterial action of lactic and the volatile fatty acids of perspiration, and reported their results in the *American Journal of Medical Science.* Subjects were encased in rubber bags and put in heat cabinets to induce sweating.

It was found that perspiration as secreted contained lactic acid in amounts sufficient to give it some bactericidal action. Evaporation on the skin increases the lactic acid concentration and makes for greater bactericidal activity. The concentration must be such as to give a pH of 5.3 or lower for the lactic acid to have much effect. The volatile fatty acids present appear to be formed by bacterial action on the lactic acid, and are present in smaller amounts than lactic acid. They are relatively more effective in the pH range of 5.3 to 6.2 and may extend the antiseptic action of perspiration over the regions of the skin where this pH range prevails. (Through *Soap* **20**, *115, 1944.*)

Experimental Spray Drier. Design of a laboratory spray drier which has been used to produce excellent quality dried milk, egg and Irish moss is reported. This is a cyclone drier with a two-foot diameter drying chamber 14 inches high and a collecting cone four feet high. The capacity is about one gallon per hour of liquid. The maximum air volume is approximately 90 cubic feet per minute. Glass windows in the top of the chamber permit inspection during operation.

The inlet air temperature is thermostatically controlled to within two degrees F. (plus or minus one degree). The inlet and outlet air temperatures and those at three points down the side of the cone are measured, also the static pressures on the inlet and outlet air. The spray nozzle uses a compressed air atomizer at pressures which may be varied from 5 to 25 pounds per square inch. Liquid and air orifices may be varied independently.

The unit can be used to give general trends of the factors affecting drying efficiency and quality of product, although there are inherent differences from results of actual plant operation.

Digest from "A Laboratory Spray Drier," by A. H. Woodcock and H. Tessier, *Canadian Journal of Research*, **21**, *75-78, September 1943.* (Through *Food Industries* **16**, *No. 1, 125, 1944.*)

Mucilage of Senna Seeds—By John Rae. Having previously described the oil of Alexandrian senna seeds (*P. J., 1942,* **149**, *74*), experiments have subsequently been made on the mucilage obtained by boiling the seeds in water. Five grams of the seeds were ground, put through a 20 sieve, boiled for half an hour with 500 mils of distilled water, allowed to stand for twelve hours and then strained through muslin.

The mucilage was tested with Fehling's solution, Mayer's reagent, and for phosphates; all with negative results. 10% of dilute hydrochloric acid gave a slight precipitate, as did alcohol 90%. Strong solution of ammonia and solution of potassium hydroxide caused a darkening in color but no precipitate. As this 1% mucilage was rather thin a further quantity was made, using 2.5% of the ground seeds. The resulting mucilage, which was a pale yellow color, was just pourable and had a slight taste of senna.

Emulsifying Properties

The following emulsion was made:

Mucilage of senna seeds, 2.5%	25 mils
Liquid paraffin	25 mils
Sodium benzoate	0.2 gm.
Distilled water	50 mils

The solution was put through a homogeniser and produced a satisfactory product; except for slight creaming it has remained stable for three months. The mucilage was found to be slightly superior in suspending 10% of calcium carbonate in distilled water, when tested against the same quantity of mucilage of tragacanth.

The ground seeds were tested for anthraquinone derivatives with nega-

tive results. The test used was that described by Fairbairn (*P. J., 1942, 148, 198*), no trace of color being obtained even after standing for half an hour. As a control 0.1 gm. of whole senna capsule well broken up gave an immediate reaction. It is suggested that possibly ground senna seeds might, in view of the large amount of water they absorb, be used internally in the same way as psyllium seeds are now used. (Through *The Pharmaceutical Journal* **151**, *241, 1943.*)

Urea in Hand Creams. In a paper of *Arch. Dermatol. Syphilol.* (**48**, *47 (1943)*, Rattner tells of patch tests made on 500 patients of a hand cream with a vanishing cream base and containing 3% urea. There were no reactions in any of the subjects, indicating that urea is not a primary irritant. Its presence in the cream helped improve the skin condition of a number of the patients suffering from dermatitis resembling chapped skin. Others whose hands were frequently in water preferred this hand cream to others not containing urea, in a ratio of ten to one. (Through *J. Am. Prof. Pharm.* **9**, *682, (1943.)*

Dentifrice. Can. 413,745, July 6, 1943. A liquid dentifrice consists approximately of calcium sulfate 170, tricalcium phosphate 50, the reaction product in alkaline solution of a higher fatty acid chloride with a high molecular split-off product of albumin such as lysalbinic and protalbinic acids 25, a wetting agent two, glycerite of starch 120, glycerol 10-20, and water 42-62 parts by weight. (Through *C. A. 38, 1080, 1944.*)

Washing agent for live hair. Ger. 733,571, Feb. 25, 1943. Sulfuric acid aliphatic esters with more than 11 C atoms of which 12, 14, 16 or 18 are not interrupted are used for washing live hair. Acidifying substances are added to the ester. (Through *C. A.* **38**, *1080, 1944.*)

The possible toxicity or Pb. alloys. I. Experiments on the rat with solder. Geo. R. Cowgill and Kurt Salomon. *J. Ind. Hyg. Toxicol.* **25**, *81-9 (1943.)*—Rats receiving 300 parts of lead per million of diet in the form of solder pellets proved to be quite similar to the control group fed an identical diet but no lead, with respect to growth, concentration of blood hemoglobin and the appearance of stippled cells as well as with respect to the amount of lead stored in their carcasses. Ingested solder of the composition studied as a source of lead is nontoxic for the young rat. *II. Experiments on the dog with solder.* Kurt Salomon and Geo. R. Cowgill. *Ibid. 91-7.*—It is concluded that the lead present in the form of solder pellets is only moderately absorbed and stored by the puppy. No signs of lead poisoning could be detected in the animals receiving such pellets. (Through *C. A.* **37**, *6031-32, 1943.*)

Soap from Turkey-red oil and from castor oil. A. M. Serebryakov. *Tekstil. Prom. 1943, No. ½, 24-5.*—Castor-oil soap is made from castor oil 100, dry sodium hydroxide 15, dry sodium carbonate 2.5 kg. The sodium carbonate is added toward the end of the boiling. To prepare "alizarin soap" (i.e., soap from Turkey-red oil) place 20 kg. of castor oil in a barrel provided with a spigot at the bottom. Add concentrated sulfuric acid 7.5 kg. in small fractions over a period of five-six hours with constant stirring. The temperature should not rise above 25-30°. On the following day drain the excess acid and wash with 60 liters of water. The next day wash twice with a 20% solution of sodium chloride, using 60 liters each time. Allow the water to settle out and drain. Neutralize with sodium carbonate solution (2.7 kg. in 34 liters water). These soaps are effectively used in the wool mills. (Through *C. A.* **38**, *1134, 1944.*)

The four known crystalline forms of soap. R. H. Ferguson. *Oil & Soap* **21**, *6-9 (1944.)*—It has been established that fibers or soap crystals may exist in distinctive modifications with differing properties for com. soaps of differing types. There is an α (alpha) and β (beta), modification for pure sodium palmitate and stearate. A third type, the γ (gamma) phase, has been found which accounts for a large proportion of commercial soap. A fourth form, the delta, has recently been described. The establishment of the four forms of solid soap has stemmed directly from X-ray diffraction work. These phases depend on the fat, water and electrolyte composition of the system, and also the processing methods used. Rapid chilling induces the gamma phase while slow cooling increases the amount of Beta Soap milling and extrusion induce changes in properties. An 80 tallow 20 coconut oil soap of 6% water and containing considerable Beta, when extruded, a conversion to gamma is obtained and the lather power reduced. The production of delta phase results from rapid cooling of fairly dilute sodium palmitate solutions, or it is formed by extrusion at high moistures. Soaps of high molecular weight favor its formation. Effects of moisture and fat composition are discussed. (Through *C. A.* **38**, *1134, 1944.*)

The acute toxicity of vapors of several monoalkyl ethers of ethylene glycol. Harold W. Werner, James L. Mitchell, John W. Miller and Wolfgang F. v. Oettingen. *J. Ind. Hyg. Toxicol.* **25**, *157-63 (1943.)*—Minimum lethel concentration expressed as mg./liter indicates that the ethylene glycol ethers decrease in toxicity in the following order: Butyl, Methyl, Propyl, Ethyl and iso-Propyl. The minimum lethal concentrations for mice are 700, 1480, 1530, 1820 and 1930 p.p.m., respectively. (Through *C. A.* **37**, *6032, 1943.*)

Angico gum. Jose Luiz Rangel. *Rev. quim. ind. (Rio de Janeiro)* **12**, *16-18 (128-30) (1943)*; *cf. C. A.* **31**, *8980.*—The various species of Piptadenia from which this gum, used medicinally and as an adhesive, is obtained, are described, and their uses for technical purposes are discussed. The gum is chemically similar to gum arabic, but because of the primitive methods of collection and packing is of inferior quality.

Mixed Calcium Salts of Soaps and Anionic Detergents. Gilbert D. Miles and John Ross. *Ind. Eng. Chem.* **35**, *1221-4 (1943).*—Decrease in foaming and detersive properties of mixts. of sulfated detergents, soap, and calcium salts is attributed to the formation of mixed salts of calcium with fatty acids and the synthetic detergent. The mixed salt calcium laurate lauryl sulfate was definitely characterized. It is stable in solutions when the pH is more than 5.2.

World-Wide Survey of Oil of Lavender

Changes brought about by steam distillation shown in this second article on lavender oil. Physico-chemical properties, yield of oil. Total production in Southern France

by DR. ERNEST GUENTHER

Chief Research Chemist, Fritzsche Brothers, Inc., New York, N. Y.

UNTIL ABOUT FORTY YEARS ago in Southern France, all lavender oil was distilled in portable direct fire stills. These stills, with their characteristic still heads (*tête des Maures*), were small, holding about fifty kilos of plants and fifty kilos of water. The flowers were completely immersed in water, the latter brought to a boil by fire beneath the still. Wood from the nearby forests served as fuel. The stills were practical, as they could easily be installed in any locality favored by ample flower growth; a brook or fountain supplied the water for the condensers. As long as the operator took care not to "burn" the flower material through contact of the open fire with the still walls, the oil was of good quality and represented the only type of oil known at that time. The oils were evaluated by their perfume which depended upon the region, the altitude and the quality of the plant material employed.

Farmer Distillation of Lavender

CONSTITUENTS DISCOVERED

A new chapter in the story of lavender oil opened when, in 1892, Bertram and Walbaum investigated the chemistry of lavender oil and proved linalyl acetate and linalool to be the main constituents. Theoretical considerations led to the conclusion that the action of boiling water upon the immersed plant material during distillation would bring about partial saponification of the esters. In order to increase the ester content of lavender oil the plant material must not be left in contact with boiling water, it should instead be distilled with direct steam.

STEAM DISTILLATION

In 1905, Schimmel & Co. erected a modern distillation plant in Barrême (B.A.), the center of the French lavender region. The work accomplished therein had a tremendous and most beneficial influence upon the lavender oil industry in general. Through a series of systematic experiments the Schimmel chemists[1] proved that steam distillation as compared with water distillation (plant material immersed in boiling water) had the advantage of giving a higher yield of oil, moreover oils with a considerably higher ester content (up to 10 per cent more) than those obtained by the old-fashioned water distillation.

It was also found that *rapid* distillation with steam from a separate steam boiler, increased the ester content of the same plant material by about 4 per cent.

LOSS IN DRYING

In the course of their work the Schimmel chemists furthermore proved that the plants during drying lose considerable weight (from one-third to al-

STEAM VS. WATER DISTILLATION

A typical distillation test is the following:

		Oil yield p.c.	$d_{15°}$	α_D	p.c. ester	Solubility in 70 p.c. alcohol
1.	Steam distillation	0.81	0.8894	— 8°4'	50.9	Soluble in 6.0 to 7.0 vol. and more with slight opalescence.
	Water distillation	0.71	0.8871	— 6°47'	44.0	Soluble in 3.0 vol. and more.
2.	Steam distillation	0.82	0.8905	— 8°0'	53.7	Soluble in 7.0 vol. and more with slight turbidity.
	Water distillation	0.75	0.8880	— 6°21'	43.6	Soluble in 3.3 vol. and more.

most one-half of the weight of the freshly cut plants) by evaporation of water. This is accompanied by a slight loss in oil, particularly of the more volatile terpenes. Oils distilled from dried plant material possess, therefore, usually a somewhat higher specific gravity. The evaporation of ester during the drying of the plants is only small but may amount up to 10 and even 25 per cent of the total loss in oil. The following table[2] gives a good indication of the quality of oils obtained from fresh and dried lavender.

	Material used	Loss of weight upon drying	Yield of oil computed with refer. to fresh flowers	$d_{15°}$	α_D	p.c. ester	Solubility in 70% alcohol
1.	a. Fresh flowers		0.84%	0.8891	—7°20'	50.3	Soluble in 6.0 vol. and more with slight turbidity.
	b. The same after drying 1½ days	35%	0.79%	0.8905	—7°33'	51.8	Opalescence rem. after addition of 10 vol.
2.	a. Fresh flowers		0.87%	0.8859	—9°4'	46.9	Soluble in 4.5 vol. and more, with opalescence.
	b. The same after drying 4 days	47%	0.79%	0.8884	—9°33'	49.2	
3.	a. Fresh flowers		0.80%	0.8875	—8°10'	47.1	Sol. in 3.0 vol. and more.
	b. The same after drying 5 days	47%	0.72%	0.8899	—8°44'	51.1	Sol. in 4.2 vol. and more.

BEST YIELD OF OIL

The work undertaken in Barrême proved conclusively that *rapid* distillation with *direct steam* (generated in a separate steam boiler) of *fresh* plant material gives a better yield of oil, and oils of considerably higher ester content than distillation of lavender immersed in boiling water.

EFFICIENT STEAM STILLS

In efficient steam stills of average size, dried or semi-dried lavender can be distilled within 40 or 45 minutes, wet or fresh plant material requiring more time. The bulk of the oil usually distills over, after about 20 minutes, provided the plants have been properly charged into the still. The steam connecting pipe (gooseneck) and the condenser tubes must be of sufficiently large diameter to permit rapid distillation. For the same reason, the stills should not be of too large capacity, unless a large volume of steam can be generated in the steam boiler. The distillate must run cold, otherwise some oil remains dissolved or suspended in the distillation (condensed) water and is lost.

The distillation waters are sometimes redistilled but this oil of cohobation is of inferior quality, low in esters, high in free alcohols. It must not be added to the direct oil, as it would impair its quality. Accumulated quantities of cohobation oil are occasionally "reconstituted" by acetylation in order to increase the ester content. Such oils form a good natural base for synthetic lavender oils.

Lavender Harvest

NEW ANALYZING METHODS

Towards the end of the last century the Schimmel laboratories developed new methods of analysis basing the evaluation of lavender oil primarily upon its ester content (linalyl acetate). This gave the buyers a reliable method of testing the quality of this oil which, so far, had been judged merely by olfactory tests.

IMPROVEMENTS

It could be shown that plant material growing in the highest altitudes, when distilled rapidly with direct steam, yielded oils containing as much as 52 and, in a few exceptional cases, even 60 per cent linalyl acetate. The old method of distillation with boiling water would yield, with the same plant material, only about 40 per cent ester. The work of Schimmel & Co., although in the beginning much disputed[3] and fought by old time distillers, affected the structure of the whole French lavender industry. More and more the direct fire stills were abolished and replaced by small stills, also of the portable type, where the steam was generated in a separate steam boiler. The result was a general increase in the ester content of commercial lavender oils. The old direct fire stills, too, were improved by inserting grids above which the flowers were packed without coming in contact with the boiling water beneath. This feature alone increased the ester content of lavender oil by about 5 per cent, as compared with the old-fashioned distillation method. Aside from this improvement, many new types of portable stills were constructed, for instance, small stills mounted on carriages with separate steam boilers which could easily be transported into the mountains where the flower supply was ample and of easy access.

LARGE SCALE DISTILLATION

At the same time a decided trend toward large scale factory distillation set in. The idea first developed by Schimmel & Co. was soon followed by other manufacturers. Slowly production of lavender oil became organized along the lines of modern agriculture and industry. In Barrême, headquarters for the highest quality of lavender, other distillation plants sprung up until this village in the Basses-Alpes boasted over about a half dozen of good sized distilleries. This trend remained by no means confined to Barrême. Distillation plants, capable of handling daily large quantities of flowers, were constructed in other sections of the lavender region, particularly in the Départements of Drôme and Vaucluse.

FLOWER SUPPLY PROBLEM

With this trend, in certain centers of the lavender regions, the problem of flower supply became of ever increasing importance. Large scale production required a regular supply of plant material which still had to be brought over long distances from the slopes of the surrounding mountains. It became necessary for each distiller to set up a regular purchasing organization with flower brokers and weighing posts distributed over the various villages in the growing regions. The cutters would then carry their daily harvest from the mountains down to the next village where the brokers, working mostly on a commission basis, weigh the plants, pay or credit the cutter, and store the material until a sufficiently large lot warrants transportation to the factory. The competition for flowers among the various agents buying for different distillers, frequently tends to drive the prices to unwarranted levels, the cutters and small growers taking advantage of the situation.

DISADVANTAGES ENTAILED

As explained, during storage and particularly during the transport to the

[1] *Ber. Schimmel & Co.*, 1907, 71.

[2] *Ibid.*

[3] The main objection against the steam distilled oils was their slightly inferior solubility.

distilleries, the plants lose considerable weight by evaporation, also by shattering of the dried flowering tops and, therefore, the distiller is unable to check the actual weight and the prices paid by his agents to the plant cutter. In other words, the distiller is completely at the mercy of his field brokers as to weights and prices of his raw material and consequently in regard to yield of oil and finally success or failure of his whole distillation campaign. This practice has often been critcized and severely condemned as the main disadvantage at which the large distiller, nowadays, is placed in comparison with the small operator who processes only his own lavender supply from his nearby patch fields.

It is one of the main reasons why, today, the whole industry has reverted to small scale operation. Today, the bulk of lavender oil is again produced by a great number of small lavender growers and distillers who process their plant material mainly in small but modernized stills. The large lavender distilleries which were constructed years ago produce today only a small percentage of the total output.

YIELD OF OIL

The yield of lavender oil depends upon many factors, particularly climatic and weather conditions, altitude, method of cutting, the condition of the plant material (fresh or dry) and the method of distillation.

1. The weather considerably affects the yield of oil; plant material cut during dry and sunny days yielding more oil than that cut on cloudy or rainy days.
2. At the beginning and toward the end of the harvest, the yield is lower than during the period of full bloom.
3. The altitude also seems to be of influence upon the yield.

At an elevation of about 1,000 meters the average yield for wild growing lavender is about 500 grams per 100 kilos of plant material, while lavender from altitudes of about 1.400 meters yields only from 300 to 400 grams of oil. Exceptional yields of 600 to 700 grams have been reported for wild growing plants.

It is said that lavender from plantations gives a better yield than that growing wild, 700 to 900 grams being normal, 800 to 850 grams the average. Exceptional yields of one kilo and even more have been encountered. Lavandin gives a considerably higher yield than true lavender.

As far as the yield of oil per acreage is concerned, Antoine Chiris[4] reported:

2	years	old	plantations		8 to 10	kilos	of	oil	per hectare
3	"	"	"		18 to 23	"	"	"	"
4	"	"	"		18 to 30.4	"	"	"	"
5	"	"	"		14 to 30.5	"	"	"	"
6	"	"	"		18 to 32	"	"	"	"

PHYSICO-CHEMICAL PROPERTIES

Genuine lavender oils, partly of own distillation, imported from Southern France and analyzed in the New York laboratories of Fritzsche Brothers, Inc., had properties which varied between the following limits:

Oil of Lavender, Type 50% Ester Content

Specific Gravity at 25°	0.882 to 0.887
Optical Rotation at 25°	—6°37' to —8°50'
Refractive Index at 20°	1.4588 to 1.4600
Ester Content, calculated as Linalyl Acetate	49.2 to 53.7%
Solubility at 25°	Soluble in 2.5 to 3.5 vol. of 70% alcohol; clear to opalescent with more.

Oil of Lavender, Type 38 to 42% Ester Content

Specific Gravity at 25°	0.880 to 0.885
Optical Rotation at 25°	—5°28' to —8°40'
Refractive Index at 20°	1.4600 to 1.4620
Ester Content, calculated as Linalyl Acetate	37.3 to 43.7%
Solubility at 25°	Soluble in 2.0 to 3.0 vol. of 70% alcohol; clear to opalescent with more.

Intermediate Type

Specific Gravity at 25°	0.881 to 0.886
Optical Rotation at 25°	—7°58' to —8°45'
Refractive Index at 20°	1.4585 to 1.4607
Ester Content, calculated as Linalyl Acetate	44.8 to 48.8%
Solubility at 25°	Soluble in 2.0 to 3.0 vol. of 70% alcohol; clear to opalescent with more.

A high ester content is associated with a high specific gravity, a high laevorotation and a low refractive index, and vice versa.

Gildemeister and Hoffmann[5] reported the following limits for French lavender oil:

Specific Gravity at 15°	0.880 to 0.896
Optical Rotation	—3.0° to —11.0°
Refractive Index at 20°	1.4580 to 1.4640
Ester Content, calculated as Linalyl Acetate	30.0 to 40.0%; in high class oils above 50.0%, up to 61.7% as highest observed limit.
Solubility at 20°	Usually soluble in 2.0 to 3.0 vol. and more of 70% alcohol. Some oils, especially those distilled with live steam require 10 vol. of 70% alcohol, the solutions occasionally remaining opalescent.

The United States Pharmacopoeia, Twelfth Revision, specifies the following limits for oil of lavender as distilled with steam from the fresh flowering tops of *Lavandula officinalis* Chaix ex Villars (*Lavandula vera* De Candolle):

Specific Gravity at 25°	0.875 to 0.888
Optical Rotation at 25°	—3.0° to —10.0°
Refractive Index at 20°	1.4590 to 1.4700
Ester Content, calculated as Linalyl Acetate	Not less than 30.0%
Solubility at 25°	Soluble in 4.0 vol. of 70% alcohol.

PURCHASE OF OIL IN FRANCE

Since the bulk of French lavender oil is produced again by small operators, the exporters must purchase their requirements through a network of field brokers, who are intimately acquainted, usually related with the peasants. Since it is almost impossible to analyze every small lot of lavender which varies sometimes from ten to twenty kilos only, the field broker must be well aware of the honesty of the various producers and buy only those lots which he trusts and evaluates as pure. For those experts a simple odor test is a surer guide than a lengthy chemical analysis.

LAVENDER MARKETS

There are also lavender markets held regularly in the main centers of the producing regions, for instance, in Digne (B. A.), where the farmer-producers offer their output of oil to the exporters, to the houses in Grasse (A. M.), or their representatives. The actual buying, however, is usually done during the following days when the commotion of the market has abated and the farmers no longer expect higher prices.

As a rule, the small producers prefer to hold on to their oil until the market, in their opinion, has reached its highest level. Unless pressed by financial obligations, they are usually in no hurry to sell. For a foreign buyer, the most opportune time of purchasing lavender oil is right after the harvest; at that moment heavy stocks

[4] *Parfums de France* 8 (1930), 227.

[5] *Die Ätherischen Öle*, 3d Ed., Vol. III, p. 654.

of oil have accumulated and the small producers are disposed to realize some cash for the continuance of their other agricultural activities.

TOTAL PRODUCTION IN SOUTHERN FRANCE

About fifteen years ago total production of lavender oil in Southern France ranged from 140,000 to 150,000 kilos. Since then, however, production has fallen off considerably, varying in the years preceding World War II from 40,000 to 80,000 kilos. Several factors were responsible for this decrease, for instance, the gradual decay of plantations and the lack of labor for cutting the wild growing plants in the higher mountains. Production, of course, can be increased if sufficiently high oil prices permit better wages for cutting the wild lavender.

The advent of the lower priced lavandin, its largely expanded production and employment in the soap industry has greatly contributed to the decline in the production of true lavender oil.

As far as the production of lavender oil in the various départments of Southern France is concerned, Abrial and Gattefosse[6] gave the following statistics:

Bouches-du-Rhône			100 kg.
Alpes-Maritimes:—Arrondissement	Grasse	2,200 kg.	
"	Puget-Theniers	170 "	
"	Nice	2,800 "	
		Sub-Total	5,170 "
Basses-Alpes:—Arrondissement	Barcelonette and Castellane	3,100 kg.	
"	Digne	2,750 "	
"	Forcalquier	5,700 "	
"	Sisteron	1,300 "	
		Sub-Total	12,850 "
Hautes-Alpes			7,000 "
Vaucluse			9,500 "
Drôme			30,000 "
		Grand Total	64,620 kg.

[6] *Parfumerie moderne* 31 (1937), 183.

SMALL ORDER EXEMPTIONS

Following are various chemicals coming under small order exemptions under W. P. B. orders:

Aluminum chloride, anyhydrous 600 lbs.
Formaldehyde 37% sol....10,000 lbs.
Hexamethlyenetetramine ..10,000 lbs.
Methanol .....540 gals.
Methyl abietate.....5,000 lbs.
Methyl, abietate, hydrogenated 5,000 lbs.
Pentaerythriol .....100 lbs.
Potash .....5 tons
Zinc oxide.....2 tons
Lanolin .....10 lbs.
Isopropyl alcohol.....1 drum

Cosmetics and toilet preparations will be adequate this year to the extent that containers are available, the office of War Information reports.

Shortages are not expected to be acute, except for lanolin, alcohol, and isopropyl alcohol. Other ingredients will be adequate.

Some lipsticks will reappear in metal containers and plastics will be used extensively.

Exorbitant Profits in British Black Market

One of Our English Friends Writes Us of Unfair Practices

A PROFIT OF 1,400% is no mean grab, but that is only the beginning of the rapacity of Black Marketeers in Britain whose greed has been encouraged by sheer audacity in passing off as genuine pre-war perfumes crude materials which are priced out of all proportion to the value of the contents. The depressing aspect of the situation is that the touts find enough dealers to stock the material, and a public prepared to pay the huge prices demanded. These black market substitutes are being sold freely, and in increasing amounts, to chemists, department stores and other retail outlets, as the products of famous perfumery houses.

Here is how the racket is worked, and will work until it is stamped out by public cooperation—if and when given. Selected districts are worked systematically by skilled high pressure salesmen who sell for cash, and then disappear to turn up again in some other part of the country, where the same process is again put into operation. One firm suffering from these activities is the world-famous house of Yardley's, of Old Bond Street, London. The salesman tells his prospective pigeon that he has obtained a supply of genuine old-fashioned Yardley's perfume from the stock of a country dealer who has gone bankrupt, or in some other way has found himself without further need for the merchandise. Does that dealer wish to share in the stock? Does he!

The buyer takes the merchandise, marked with the name of this famous house, or another equally as well known, and pays cash on the spot. He is given a receipt in a fictitious name and address.

The salesman is never seen again, until he reappears in a new city to work the same routine. If, in the interval, the firm has warned its clients against the racket, he has merely to alter the bottle labels to some other well known brand.

Knowledge of the routine came when certain cities began to be suspicious of large quantities of famous perfumery which were offered at a time when the firm itself was having difficulty in meeting demand. Inquiries which were set on foot led to merchants sending samples of their purchases to the alleged makers. They were informed that the perfumery, bought at 7/6 was not worth 6d, and that it was not genuine.

Lipstick has also been involved in this racket. Just as with perfumery, it has been freely sold in a variety of centers.

The danger lies in the country being flooded with spurious manufacturers' stock. The owners of the genuine brand are powerless to stop the practice since anyone who can locate a printer prepared to handle the brand printing can obviously make a very profitable business of resale of dud perfumery at excessive rates.

This might even be regarded as a situation where a brand name might become a disadvantage, since spurious products marketed with a reputable brand mark can cause considerable damage to that brand. Strong action is being taken to meet the situation but the difficulty of apprehending the salesmen is obvious. They never stay long enough in one place to be caught, and they are never conspicuous enough in appearance to be remarkable, furthermore they operate in areas that are absolutely unknown.

The Prevention of Autoxidative Rancidity in Fats and Oils

by ERICH BOEHM, Ph.D., and REGINALD WILLIAMS, Ph.D.

THE MOST IMPORTANT and most interesting form of rancidity is that produced by the spontaneous interaction of atmospheric oxygen with an oil. This type of rancidity arises from oxidation processes which take place primarily at the unsaturated centres of the different components of the oil. It is characterised by a loss of palatability, due to deterioration in taste and odour; furthermore, recent investigations have shown that there is an accompanying decrease in the vitamin potency of the oil.

These oxidation processes are autocatalytic in nature, an initial slow period at almost constant velocity being followed by a period of comparatively rapid reaction.

A more comprehensive interpretation is that advanced by Christiansen, whereby the oxidation process is visualized as a chain reaction.

Inhibitors function by breaking these reaction chains when they collide with highly energised peroxide molecules; activated inhibitor molecules thus formed may or may not be subsequently oxidised but in any case they fail to activate further molecules of the autoxidising substance.

NATURAL ANTIOXIDANTS

Certain features displayed by vegetable oils during autoxidative processes contrast markedly with those of animal oils. The former oxidise with a less well-defined induction period. Furthermore, the point at which organoleptic rancidity occurs in an animal oil coincides with the rapid increase in peroxide formation, whereas vegetable oils exhibit organoleptic rancidity a considerable time before the rapid accumulation of peroxides. These characteristic differences are due to the presence of natural antioxidants in vegetable oils.

These natural antioxygens, to which the terms "inhibitols" was ascribed, were found to be effective antioxidants for animal fats, purified fatty acids and esters, but they failed to show any antioxygenic activity even when added in relatively large amounts to vegetable oils.

A wide variety of vegetable oils constitute a source of vitamin E. The isolation of this vitamin by Emerson and the demonstration of its antioxidant activity led to the conclusion that some, if not most, of the activity of the inhibitols, was attributable to the different tocopherols, which are claimed to have vitamin E activities. Later, Golumbic isolated a red liquid fraction from certain autoxidising vegetable fats by chromatographic adsorption. This fraction, which was quite distinct from the tocopherols, was found to exhibit antioxidant properties.

Consideration of the chemical properties and reactions of this red oil indicated that its constituents were probably chroman-5:6-quinones, which possibly occurred in the original vegetable fat as colourless, quinol forms. This was followed by the discovery that the induction periods of vegetable fats were made up of two parts. In the first tocopherols inhibit the autoxidation and at the same time chroman-5:6-quinones accumulate in the substrate. Then, as the tocopherols disappear, the autoxidation is inhibited by the chroman-5:6-quinones. By comparing the rates of these two reactions it was found that the tocopherols disappeared much more rapidly than the quinoid compounds and that the complete disappearance of the latter compounds coincided with the rapid increase in peroxide formation, though the fat was organoleptically rancid a considerable time before this. The successive action of these two types of natural antioxidants, coupled with the slow rate of change of the chroman-5:6-quinones, explains the absence of well defined induction periods in vegetable fats.

ANTIOXIDANTS CLASSIFIED

Our knowledge of the intricacies underlying the synergistic action displayed by certain combinations of antioxidants is also increasing. This action was first discovered by Olcott and Mattill in 1936. From an examination of the antioxidant activities of a large number of chemical substances, in different fat substrates, they suggest a tentative classification of antioxidants.

1. Acid type, which include some inorganic acids, e.g., phosphoric and sulphuric acids, and also certain organic acids in which the carboxylic group is activated by the close proximity of a second carboxylic group, a carbonyl group or an hydroxyl group—effective antioxidants for vegetable oils and their crude esters.

2. Inhibitols and hydroquinone—inhibit the oxidation of distilled esters of vegetable oils, lard, esters of lard, distilled fatty acids and esters.

3. Phenolic type—which are effective antioxidants for animal and vegetable oils.

An antioxidant of Class 1 when used in conjunction with one from Class 2 or Class 3 was found to prolong the induction periods of animal fats to a much greater extent than would have been expected from a summation of the effects of each used alone. This remarkable increase in antioxygenic activity has been since referred to as the "synergistic effect." In 1942 Golumbic postulated that when quinones or hydroquinones are added to autoxidising fats an equilibrium, quinone-hydroquinone is established. Addition of phosphoric acid to such a system shifts the equilibrium to the right; this explains the synergism shown by quinone and phosphoric acid, and by hydroquinone and phosphoric acid. Tocopherols on oxidation give tocoquinones which on reduction yield tocohydroquinones. In the presence of mineral acid (e.g., phosphoric) these latter compounds cyclise, regenerating tocopherols. This cycle of changes, together with the inhibiting action of phosphoric acid on the oxidation of tocopherol itself, provide adequate explanation for the synergism displayed by mixtures of tocopherols and phosphoric acid. The increased antioxygenic activity produced by the addition of cephalin to a tocopherol has been ascribed to promoter action. It would, therefore, seem that the mechanisms associated with this synergistic action are specific for each combination.

SYNTHETIC ANTIOXIDANTS

A wide variety of chemical substances is known to possess different degrees of antioxygenic activity, e.g., certain inorganic acids, phenols, substi-

tuted aromatic amines, aliphatic acids, etc. Of the phenols, hydroquinone, catechol, pyrogallol and 1:2:4-hydroxyhydroquinone, are perhaps the best known. It is well known that phenol, resorcinol and phloroglucinol show no marked antioxygenic activity. This fact seems to indicate that, for the compound to exhibit antioxidant activity, not only must there be more than one hydroxyl group linked directly with the aromatic nucleus, but also the relative positions of these substituent groups must play an important role.

These synthetic antioxidants find application in as widely different industries as the manufacture of soap and the making of rubber. If an antioxidant is to be incorporated in pharmaceutical or medical preparations, in addition to being an effective inhibitor, it should be nearly neutral in reaction; odourless and tasteless; without effect on the colour of the preparation; easily and completely soluble in oils, so that concentrated solutions can be prepared for dilution as desired; and pharmacologically safe and harmless.

In a recent publication we have demonstrated that normal propyl gallate almost completely fulfills these requirements, and in addition we have shown that it possesses marked antioxygenic activity in a wide variety of animal and vegetable fats, e.g., arachis oil, cod-liver oil, lard, suet, bacon fat, linseed oil, soya bean oil, cocoanut oil, sweet oil, almond oil, palm oil and cottonseed oil. The preliminary pharmacological tests carried out on the ester in the Pharmacological Laboratories of the College of the Pharmaceutical Society promise favourable results, and there is every indication that this substance will prove a valuable antioxidant for pharmaceutical purposes. (Thru Pharm. J. **151**, 163-64 (1943).

OPA PLACES SECOND HAND SHIPPING CONTAINERS UNDER PRICE CEILING

Maximum prices have been established on second hand shipping containers. Prices depend on the container classification in the categories "repaired," "reusable-unsorted," "sorted by size," "sorted by size and brand name." Prices may be under the price ceiling but not above it. Both purchasers and buyers are required to keep accurate records for inspection. By May 22, every purchaser must file an inventory statement with the Office of Price Administration, Washington, D. C.

The toxicity of methyl cellulose. The extended uses of methyl and ethyl cellulose have raised questions of their possible toxicity. It is therefore of value to have a report of an investigation by Deichmann and Witherup (*J. Lab. Clin. Med., 1943*, **28**, *1725*) in which 80 rats were given methyl cellulose in their food and drinking water over a period of eight months, and the same number were given ethyl cellulose in their food for a corresponding period. The daily ingestion of quantities of methyl cellulose amounting to about 0.44 gram per rat or of ethyl cellulose amounting to about 0.18 gram per rat produced no signs of illness. The consumption of food and water as well as the gain in weight by these animals was normal. No evidence was found of significant gross or microscopic abnormalities in the tissues of the animals. It is concluded that the feeding of methyl and ethyl cellulose in these concentrations is harmless to rats. (Through *The Pharmaceutical Journal* **152**, *105, 1944.*)

Synthesis of 16, 17- and 17, 18-octadecenoic acids. Roland Kapp and Alexander Knoll. Through *C. A.* **38**, *333, 1944.*) (32.7 g.) and 2.7 g. sodium sand in 120 cc. absolute ether, mixed during 8.5 hours, heated on the steam bath for 45 minutes, treated with 26.3 g. 10-hendecenoyl chloride, the mixture allowed to stand overnight, refluxed 45 minutes and the liberated acid purified through the sodium salt, give 28% of 8-keto-17-octadecenoic acid, m. 72-2-3° (m.ps. cor.) (semi-carbazone, m. 102.5-3°). Reduction by the Wolff-Kishner method gives 65% of 17-octadecenoic acid, m. 55-5.5°. Similarly 1 and 9-hendecenoyl chloride give 23% of 8-keto-16-octadeconoic acid, m. 78.4-8.9° (semicarbazone, m. 112.8-13.5°); reduction yields 16-octadecenoic acid, m. 62.8-.5°. The position of the double bond in these two acids was established by oxidation to 1,15-pentadeca and 1,14 - tetradecamethylenedicarboxylic acids; both acids are catalytically reduced to stearic acid.

Propylene Glycol as a Possible Replacement for Glycerin. M. W. Green, K. L. Kelly and C. A. Steinmetz. *Bull Natl. Formulary Comm.*, **11** (*1943*), 91.—A review of the toxicity studies, physical and pharmaceutical properties and the solubility of pharmaceutical products in propylene glycol is offered. Reports indicate that this compound may be substituted for glycerin. The effect of low temperature upon the following N.F. products containing glycerine, or in which a part of the glycerine has been in part or as a whole replaced by propylene glycol: 19 elixirs, 8 solutions, 1 lotion, two mixtures and five syrups. (Through *J. A. Ph. A.* **33, 39, 1944.**)

Methycellulose as a colloid laxative. M. L. Tainter. *Proc. Soc. Exptl. Biol. Med.* **54**, *77-9 (1943.)*—The addition of 10% of soluble methylcellulose to the diet of rats caused no apparent pathological changes in 95 days. In human subjects the ingestion of ten grams per day approximately doubled the volume of the stools and increased their frequency. Because of its water-holding capacity each gram increased the stools by about ten grams. The possibility of liberation of methyl alcohol by hydrolysis in the intestinal tract should be investigated. (Through *C. A.* **38**, *413, 1944.*)

SODIUM PECTATE. *Chemist and Druggist*, **139** (*1943*), *405.*—Sodium pectate is extracted from sisal flesh that has been treated first of all to remove waxes and soluble glycosides, etc., by means of new technique that have been developed for the rather special problems involved in the extraction of pectic materials from the sisal plant. As marketed, it is a nearly white powder, soluble in water to give slightly alkaline hydrophilic collodial solutions of viscosity depending on the concentration, the pH and the concentration of other sodium salts present. Solution is best effected in boiling water, with good mechanical agitation. Sols. thus prepared, if of concentration of about 5% or more, set to the gel form on cooling; the gel is heat-reversible, somewhat resembling that formed by agar. Heavy-metal gelatinous pectates such as ferric, copper and zinc pectates may be readily prepared from sodium pectate for special uses. (Through *J. A. Ph. A.* **33**, *42. 1944.*)

How to teach fire fighting

A 16-page manual has been issued by Walter Kidde & Co. to aid factory executives in instructing employes in fire extinguishing techniques.

The Effect of Haying on the Oil Content of Lemon Grass and Citronella Grass

Experiments in field drying and stacking citronella and lemon grasses in Puerto Rico prove by which methods the most oil and that of the best quality may be obtained

by NOEMI G. ARRILLAGA, JOSE E. NATAL COLON, JACINTO RIVERA, and MERRIAM A. JONES

Puerto Rico Experiment Station, U. S. Department of Agriculture, Mayaguez, Puerto Rico

THE ESSENTIAL OILS of lemon grass (*Cymbopogon citratus*, (D. C.) Stapf.) and citronella grass (*Cymbopogon nardus* (L.) Rendle) have, for many years, occupied a prominent place in the perfume and allied industries. The value of lemon grass oil depends upon its content of citral, which is used in the manufacture of ionone or artificial violet; considerable use is found for the oil as such in the soap industry. The value of citronella oil depends upon its content of citronellal and geraniol, which are basic materials for a number of perfume preparations; it also is used extensively in the soap industry.

Some essential-oil-bearing plant materials require treatment prior to distillation in order to give the best results. For example, orris and vetiver roots require drying before distillation, and it has been recommended that citronella grass be dried to some extent previous to distillation. Drying offers certain advantages such as more efficient use of stills, labor, and available fuel and steam. Therefore an experiment was designed to show the effect of field drying and stacking on the yield of citronella and lemon grass oils.

FIELD DRYING EXPERIMENT

Five-hundred-pound lots of the West Indian variety of lemon grass and the Guatemalan variety of citronella grass were cut, and duplicate moisture determinations and distillations made of samples of the fresh grasses. Both lots were allowed to dry in the sun to a constant moisture content at which time a second series of distillations was made. In the experiment with lemon grass, field drying was completed in one week as compared to one month for citronella grass. This was undoubtedly due to the fact that the lemon grass was dried during the dry season while the citronella grass was dried during the rainy season. The lots were then stacked in tall slender cocks on a bamboo platform in the open, as shown in figure 1. At one-month intervals, further distillations and moisture determinations were made of samples drawn from these lots.

MAKING DISTILLATIONS

All distillations were made in six liters of water at six to eight pounds boiler pressure in a 10-gallon stillpot equipped with open steam coils. The time to build up the pressure in the stillpot was held at eight minutes. The fresh-grass samples taken for distillation were 20 pounds while subsequent dried samples of approximately the same bulk were 10 to 12 pounds due to the loss of moisture.

In order to follow the yield of oil with time, distillates were taken in fractions as follows: For each time after cutting of lemon grass, 1 to 3 distillations were made, first distillation, 5 and 40 minutes; second distillation, 10 and 60 minutes; third distillation, 25 and 80 minutes. For each time after cutting of citronella grass, 3 distillations were made, first distillation, 25 and 120 minutes; second distillation, 50 and 150 minutes; third distillation, 75 and 180 minutes.

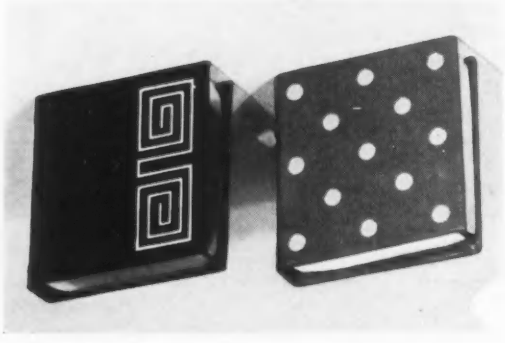
ANALYSES OF OILS

The distillates were collected and extracted twice with ether. The ether extracts were placed on a water bath at 55°C and the main part of the ether distilled off, after which the remainder was exhausted by a current of air. The yield of oil and water in each fraction was measured. Lemon grass oil was

(Continued on page 52)

Figure 1. Drying lemon and citronella grass.

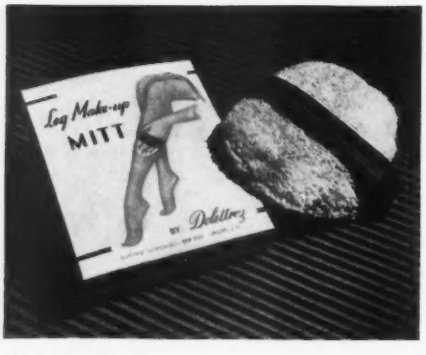
Packaging PORTFOLIO



LENTHERIC

LENTHERIC: Bright leather vanities with polka dot or scroll design with gold kid trim; plain gold kid with silver kid trim; or natural pigtex with gold kid trim come in a most unusual array of colors. Also—a deep compartment for your favorite face powder.

DELETTREZ: A leg make-up and applicator combined! Inside this new Leg Make-up Mitt is a supply of leg make-up in dry form. Just wet the Mitt and stroke it on, and it promises not to streak. This sensational item comes in three stocking shades—Beige, a light tone; Nut-Meg, a medium shade; and Topaz, a darker sun bronze shade.



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DERMETICS

DERMETICS: Here is the protection base that keeps the skin smooth and yet does not feel oily. Together, the lotion and film form a protection base quite different from the usual. It is designed to soften and protect, and serves as a perfect powder base combination. This thin, invisible dress-film is made of hydronized oils.

MAISON JEURELLE

RUBINSTEIN

RUBINSTEIN: White flame, newest and most personal perfume, comes in a cylindrical box of rich purple rayon moire having a torch-like white flame rising from the small red hearts strewn over the box. The glass stopper of this elegant flacon tapers off into a flame.

MAISON JEURELLE - SEVENTEEN: Seventeen Skinthetic Leg Make-up, a creamy liquid, comes in two shades—light and dark. Seventeen Cream Lotion is a skin softener which is applied at night after removing the leg make-up.

GERMAINE MONTEIL

SCHIAPARELLI

RENOIR

GERMAINE MONTEIL: Pink Ice rouge, flattering to almost every coloring, blonde, brunette, or red-head, is particularly lovely with gray hair. At this time, this dry rouge is shown in a handsome new ivory plastic case of feather weight, and moulded in the traditional Monteil simplicity.

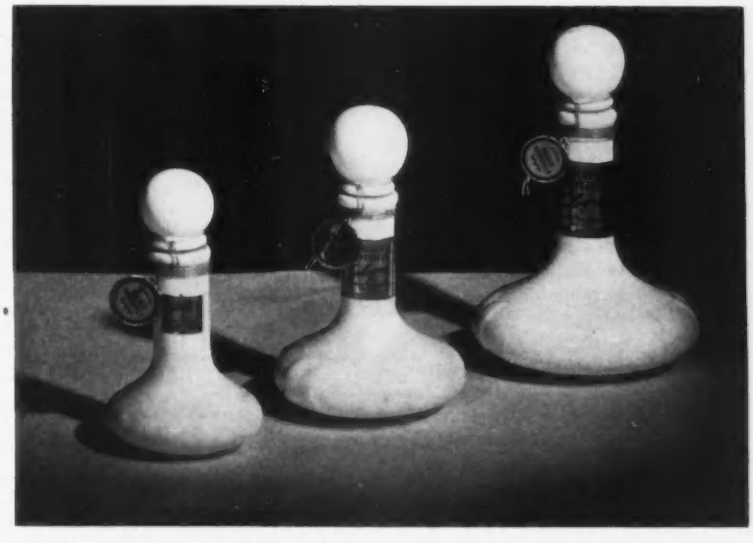
SCHIAPARELLI: A pure rose tint lipstick for brunette or blonde which sheds a faint fragrance of Shocking perfume. There is something ultra-modern in the clever contraption which locks Radiance lipstick in its dark violet plastic case. Dali, surrealist painter, is responsible for the decor.

RENOIR: Introduces a new perfume —My Alibi. Stahlhut has designed the brilliant peacock blue package which goes with it. The bottle is a slender, faceted column of frosted glass with a black stopper. Presented in four sizes.

ELIZABETH ARDEN: Created to supply a definite need, Montezuma Red exactly matches the cap cord, scarf and chevron of the uniform worn by the Women Marines. Montezuma Red lipstick, nail polish and cream rouge in a kit of forestry green, comes boxed in the same colors with the insignia of the United States Marine Corps in silver on the cover.

LUCRETIA VANDERBILT: Golden Butterfly toilet water presents the latest in packages by its exotic bottle made of ceramics. Butterflies, in relief, are encrested in 14 karat gold leaf and hand painted.

ELIZABETH ARDEN



LUCRETIA VANDERBILT

analyzed for citral content, refractive index, and solubility in 70 per cent alcohol and citronella oil for specific gravity, index of refraction, solubility in 80 per cent alcohol, and total geraniol or acetylizable constituents.[1] The data are summarized in tables 1 and 2.

EFFECTS ON LEMON GRASS

The data for lemon grass show that the yields of oil and citral decreased with time after cutting. By drying the grass in the sun 22 per cent of the oil was lost. The loss increased to 50 per cent after the grass had been stacked for 2 months. Inasmuch as the oil lost from one period to the next was very high in citral, it can be concluded that the loss of oil due to oxidation of citral was greater than the loss due to evaporation.

Table 1 shows that during the course of each distillation, except that of dried material, the citral content of the oil increased and the solubility in 70 per cent alcohol decreased while during the course of the experiment both the citral content and solubility decreased.

RESULTS ON CITRONELLA

The data for citronella grass show that the yields of oil and of total geraniol decreased with time after cutting. The oil loss sustained by field drying was 53 per cent and by field drying and stacking was 73 per cent.

Since a high percentage of total geraniol was obtained in the earlier part of the distillation, it is evident that with fresh grass the best quality oil was obtained by short distillation. According to the known chemical composition of the oil, citronellal distils over first, then geraniol and its esters. Therefore, it is concluded that the earlier fractions of high total geraniol content consisted mainly of citronellal. The specific gravity decreased and index of refraction increased with the acetylizable constituents. The solubility of citronella oil decreased with time. In all cases except the last fraction from the stacked grass, the oil was soluble in two volumes of 80 per cent alcohol.

Table 1—Effect of Field Drying and Haying of Lemon Grass on the Yield and Quality of the Oil

Fractions	Cumulative yield of oil, dry basis	Citral content of the oil	Cumulative yield of citral, dry basis	Index of refraction	Solubility in 70% alcohol
Minutes	Per cent	Per cent	Per cent		Volume ethanol per volume oil
FRESH GRASS, 58.78 PER CENT MOISTURE					
5	0.277	64.0	0.178	1.4915	1.00
10	.333	67.5	.225	1.4895	1.48
25	.550	68.0	.374	1.4914	1.58
40	.851	70.1	.583	1.4907	1.80
60	.988	69.2	.680	1.4896	2.00
80	.943	71.9	.686	1.4907	2.10
FIELD DRIED HAY, 16.51 PER CENT MOISTURE					
10	0.335	50.0	0.168	1.4935	1.51
60	.781	67.4	.510	1.4917	2.10
1 MONTH AFTER STACKING, 11.43 PER CENT MOISTURE					
10	0.297	50.0	0.148	1.4929	1.50
25	.471	61.0	.287	1.4923	1.67
60	.643	65.3	.412	1.4916	2.13
80	.846	70.3	.605	1.4914	2.13
2 MONTHS AFTER STACKING, 9.35 PER CENT MOISTURE					
10	0.296	17.5	0.052	1.4957	1.57
25	.350	17.0	.059	1.4960	1.70
60	.490	16.1	.077	1.4954	2.17
80	.466	15.3	.063	1.4935	2.27

Table 2—Effect of Field Drying and Haying of Citronella Grass on the Yield and Quality of the Oil

Fractions	Cumulative yield of oil, dry basis	Acetylizable constituents of the oil	Cumulative yield of total geraniol, dry basis	Specific gravity	Index of refraction	Solubility in 80 per cent alcohol
Minutes	Per cent	Per cent	Per cent			Volumes ethanol per volume oil
FRESH GRASS, 74.52 PER CENT MOISTURE						
25	0.514	91.50	0.499	0.9054	1.4712	0.8
50	.747	85.33	.637	.9005	1.4675	.8
75	1.110	85.13	.945	.8997	1.4700	.9
120	1.450	80.62	1.177	.9025	1.4703	.9
150	1.510	76.42	1.161	.9055	1.4703	.9
180	1.610	80.51	1.295	.9101	1.4745	1.0
FIELD DRIED HAY, 54.64 PER CENT MOISTURE						
25	0.383	80.76	0.309	0.9045	1.4686	0.80
50	.508	73.49	.373	.9047	1.4722	.85
75	.669	79.54	.532	.9078	1.4742	.95
120	.684	....	...	....	1.4823	1.0
150	.703	....	...	....	1.4832	1.0
180	.753	....	...	....	1.4848	1.0
1 MONTH AFTER STACKING, 14.51 PER CENT MOISTURE						
25	0.153	44.67	0.068	0.9002	1.4691	0.9
50	.379	54.28	.206	.8920	1.4737	.95
75	.385	60.91	.235	.8986	1.4765	1.0
120	.379	53.72	.204	....	1.4756	1.0
150	.422	....	...	....	1.4812	1.8
180	.426	....	...	....	1.4842	2.5

CONCLUSIONS

Columns 4 of table 2 shows that the total acetylizable constituents of the oil decreased considerably with time after cutting. Since losses of acetylizable constituents are sufficient to account for most of the decrease in yield of oil, it can be concluded that the major factor leading to loss of oil was oxidation. Evaporation of whole oil accounted for the additional loss.

For both grasses it can be concluded that for best results field drying with or without subsequent stacking should not be practiced.

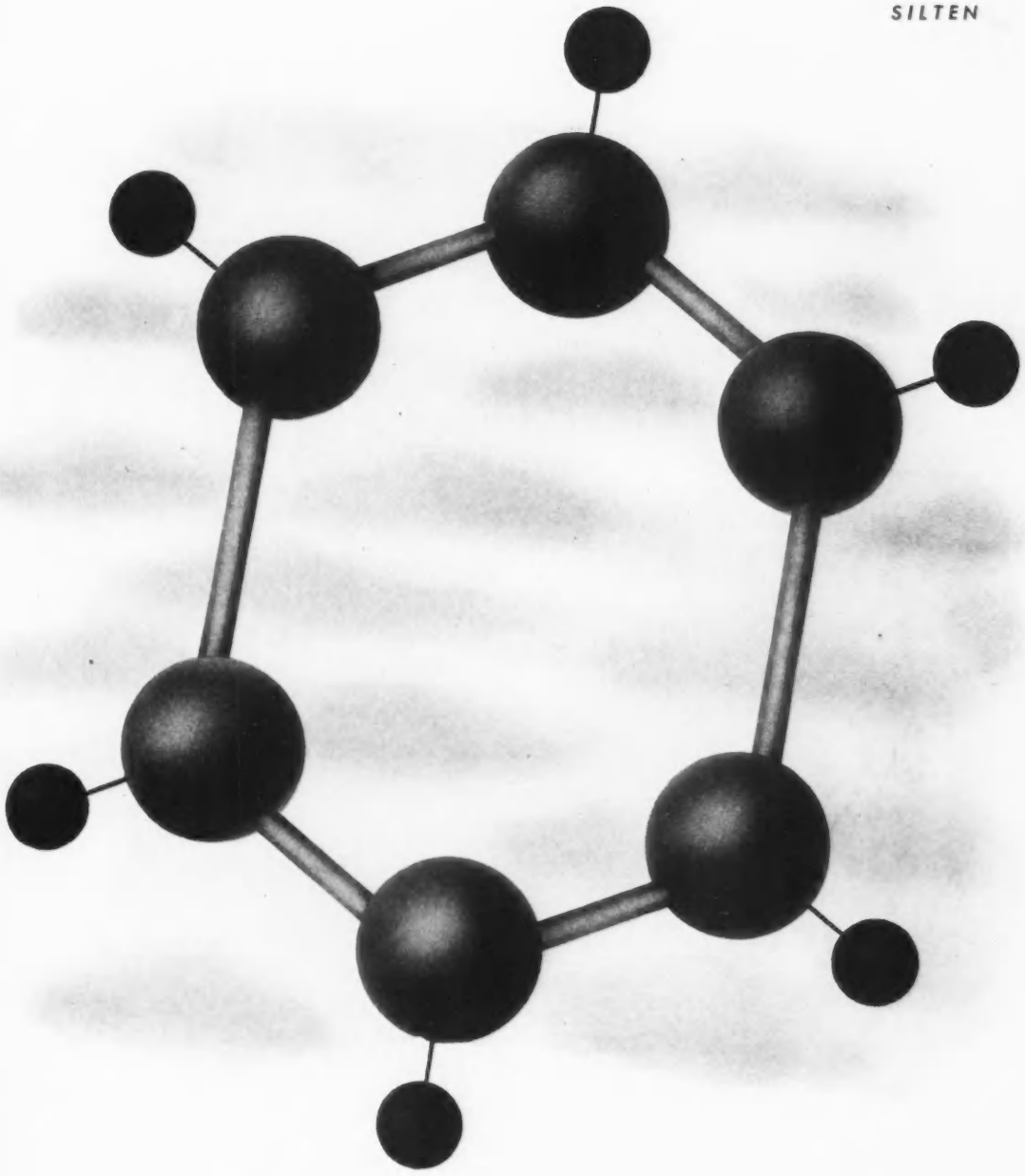
[1] This includes all constituents which can be esterified with acetic anhydride, i.e., citronellal, geraniol, and others.

N. S. Gesoalde new sec'y of N. Y. State Pharmaceutical Ass'n

Nicholas S. Gesoalde, past president of the N. Y. State Pharmaceutical Association, has been named secretary of the association to fill the unexpired term of the late Robert Lehman, who had held the secretaryship for many years.

A soap which indicates the presence of mercury fulminate is described by Howard S. Mason and Isador Botvinick in *U. S. Health Reports*, 58, 1183-6 (1943). The active ingredients of this reagent soap are triethanolamine and diphenylthiocarbazone. To help reduce the incidence of mercury fulminate dermatitis in the explosive industry, this liquid soap was developed. The soap is orange in color and in the presence of traces of mercury salts it changes to purple.—*Thru Oil & Soap*, **21**, *31*, *1944*.

SILTEN



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Givaudan has developed and made available a variety of such materials . . . and is constantly using its extensive research and product development facilities to provide others. These, together with the tried and tested "reliables" of former years which will one day return from war service, will furnish Givaudan customers with a wider and more efficient range of working materials than they have ever had before. In planning your postwar products, consider the new opportunities offered by this expanding Givaudan service in aromatic chemicals.

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Ice Cream Flavors Have Been Affected by War

Ice cream manufacturers encounter shortages of vanilla and vanilla substitutes, resulting in difference in quality of mix. Drastic scarcity of most fruit flavors

by P. S. LUCAS

Associate Professor of Dairy Manufactures, Michigan State College

ESTABLISHMENT OF A UNIFORM STANDARD for vanilla flavor in ice cream is probably impossible for all parts of the country, especially in these times of emergency. This condition exists even if enforcement officials, the manufacturer, or the public were to demand it. Fortunately, the three agencies are sympathetic and cognizant of the complicating factors and of the belief that "a half load is better than none." The spirit of enforcement, therefore, has become one of doing the best possible under the circumstances, and one of approaching as closely to the ideal as supplies and practicality will permit. The three limiting conditions are shortage of vanilla and of vanilla substitutes, differences in quality of mix, and lastly the cost of flavors due to materials and labor, which is reflected to the price limitation at which ice cream may be sold, established either by price ceilings or the ability or willingness of the consumer to pay.

PURE VS. FORTIFIED VANILLA

There are sections of the United States where daily products are not only produced in abundance, but where climatic conditions are such as to make economically possible the production of an excellent quality raw material. These sections are so closely situated to large ice cream plants that little difficulty is experienced in obtaining fresh, excellently flavored cream, milk, evaporated milk, or powdered milk, with little transportation difficulty. If an excellent mix without extract can be made it is false economy to lower its quality by the use of an inferior flavor or a flavor so strong that it will completely subdue the desirable flavor contributed by the dairy products in the mix. A good, pure flavor in combination with a good mix should result in a good, finished ice cream. It is assumed that every ice cream manufacturer is agreed that a good product increases the demand for it. This calls for the best vanilla extract obtainable.

OFF FLAVOR MIX

Other sections of the country are not as well adapted to intensive dairying, or at least do not resort to it, and therefore depend on dairy ingredients produced often at great distances from the manufacturing plant. Supplies produced under inadequate conditions and shipped long distances often develop undesirable flavors. Some such mixes cannot stand pure flavors, for the flavoring material will not cover the off flavor of the mix. Generally speaking, these conditions hold and the manufacturer can not help it. Until these conditions can be corrected the reason for the use of a fortified flavor is sound, but the fortified flavor should be well made and should not be a hastily thrown together concoction of vanillin, coumarin, sugar, prune juice and what not.

IDEAL MIX

The ideal mix should not be flavored with other than a good pure flavor. It leaves an appetite for more of the same. At the same time it doesn't sate the consumer. Between good and poor mixes there is bound to be a middle point where pure flavors will almost but not quite fulfill their purpose. It is at this point, and on, that fortified flavors may be used to advantage. No intent is meant to discourage good mixes but the matter is one of dealing with conditions as they actually exist.

AVAILABILITY OF VANILLA AND SUPPLEMENTS

Under normal conditions vanilla beans for vanilla extracts come from many sources. The world crop from these sources is given below and they have been arbitrarily placed into groups for convenience of reference.

Type	Total Crop Pounds
1. Mexicans	250,000
2. Bourbons	1,000,000
3. Quadeloupes	50,000
4. Javas	37,000
5. Tahitis	220,000
6. All others	12,000

The yield of beans, and their value,

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NATIONAL FORMULARY SPECIFICATIONS

Specific Gravity @ 25/25°C.	1.035—1.037
Distillation Range (Method 1, USPX11) I.B.P.-D.P.	185—190°C.
Ash	Not more than .007%
Acidity (As Acetic Acid)	Not more than .0115%
Chloride	Not more than .07%
Sulfate	No Turbidity*
Heavy Metals	Not more than 5 p.p.m.
Arsenic (As As_2O_3)	Not more than 2 p.p.m.
Assay (Periodic Acid Method)	Not less than 97.5% Racemic Propanediol 1, 2

*Method—Dilute 5cc. of Propylene Glycol with 15cc. of distilled water and add 5 drops of Hydrochloric Acid and 5 drops of Barium Chloride T.S.

COMPLETE DATA ON REQUEST The uses of improved Dow Propylene Glycol, N.F., are explained in detail in a new Dow booklet, now available. Physical data, charts and technical information are included in this booklet, which we shall be happy to send you. Simply write to The Dow Chemical Company.

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. . . from the tempting sugar-cured ham made from an ancient recipe by modern flavoring methods, *to the tire of odor-cured synthetic rubber*–

. . . from the commercial pickle pack that rivals the flavor of grandma's own, *to the "hot dog" that always tastes as delicious as the one before*–

. . . from the fly spray with the fragrance of toilet water *to the doctor's prescription with the peppermint flavor* –

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M M & R has led the way in the production of *replacements* for currently unavailable Essential Oils originating in lands now under enemy control. These products of the laboratory, *genuinely excellent yet truly economical imitation flavor oils and synthetic perfume oils,* offer great possibilities *today* . . . even greater potentialities for producers planning to speed new products to market *tomorrow*—WHEN VICTORY COMES!

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varies greatly according to favorableness of season. Thus the total crop varied as follows:

Year	Pounds	Value
1922	1,248,000	$2,279,000
1923	1,281,000	$2,884,000
1924	828,000	$3,610,000
1925	840,000	$5,853,000

A second source of information gives somewhat different figures, but more explicit ones for different types:

Year	Mexican	Bourbon	All Others	Total
1922	105,000 lb.	929,000 lb.	200,000 lb.	1,234,000 lb.
1923	230,000 lb.	556,000 lb.	156,000 lb.	942,000 lb.
1924	158,000 lb.	511,000 lb.	141,000 lb.	810,000 lb.

The writer has no figures on the poundage used in America or amounts used to flavor ice cream. However, if in normal times 300,000,000 gallons of ice cream is eaten annually in this country, and if 50 per cent is flavored with vanilla made entirely of beans the potential market for beans would be around 291,865 pounds to be used in ice cream. Its myriad usage in other products makes the amounts needed very large.

BEST BEANS FROM MEXICO

Approximately 90 per cent of the Mexican crop is used in America. This is regarded as the best of all beans although the Bourbon bean also is highly regarded. The Mexican crop this year is nearly normal but is smaller than in 1942 and slightly smaller than in 1943. Transportation difficulties should not reduce the amounts normally allotted this country.

BOURBON STOCK AWAITS SHIPMENT

Supplies of Bourbon beans in 1942 became alarmingly short. The arrival of the Hardaway shipment consisting of possibly 150,000 pounds greatly relieved the situation. The occupation of Madagascar by the British made this possible. But the Bourbon bean comes also from the Seychelles, the islands of Reunion, Mauritius, Nossi-bé, Comores and Mayotte. Possibility of shipping from these points is very obscure. A second shipment of Bourbons arrived from Madagascar in 1943 but was necessarily small. The Bourbon stock in Madagascar is heavy so far as information in this country goes. There are two crops lying in the stock pile awaiting shipment, but shipping space is at a premium and subject to such delays as shipping license requirements, convoy, and Navy approval. Due to the large amounts produced there, the Bourbon supply occupies a key position. Its availability is definitely a factor in the maintenance of the current vanilla supply, precarious as that is. Ordinarily priced at two to three dollars per pound Bourbon beans now cost nine to ten dollars. This has cut demand in approximately the same proportion.

OTHER SOURCES

Beans are grown in the West Indies, Gaudeloupe, the Dominican Republic, and Martinique. These compose a small percentage of the total crop, and, although being imported, do little to alleviate any shortage. Some buyers group these together as South Americans. So far as known the South American crop this year is normal.

There has always been a time when the Tahiti bean has been used in making vanilla extract for use in ice cream, but it has been used in the cheaper pure vanillas. This bean is inferior in flavor producing qualities, the extractive material resembling the odor of heliotrope. Shipping from Tahiti is embarrassed chiefly by lack of cargo space. It is to be expected that the Tahiti bean is being used to greater extent in ice cream now than normally.

The Java group of vanilla beans were grown on the Dutch possessions of Java and surrounding country. These excellent beans, because of the Jap invasion, are off the market. The original wild vanilla bean, with which Cortez became acquainted, is known as the Vanillon. It is rank in flavor, may be legally imported, but may not be legally used in extracts.

OTHER DIFFICULTIES WITH EXTRACTS

Ethyl alcohol is the best material known for the extraction of the flavoring principles of the vanilla bean. It enters into the manufacture of pure, compound, and imitation extracts. Unfortunately it is also an essential in the manufacture of essential war materials and it is consequently scarce in quantity. It also contributes to the cost of vanilla extracts. Pure vanillas may contain from 35 to 40 per cent of alcohol. Naturally other extractives have been sought but the result has not been thoroughly satisfactory. Diluents such as sugar or dextrose are almost as short as ethyl alcohol. Substitute alcohols, as extractives, are still being sought experimentally but whether a suitable one will be found is anyone's guess.

VANILLA FORTIFIERS

Vanillin and ethyl vanillin are materials used to fortify pure vanilla extracts. The latter is approximately six times as powerful as the former. Vanillin is one of the materials responsible for the flavor of the vanilla bean and occurs naturally in the bean. It is perhaps chiefly, but not entirely, responsible for the flavor. It may be prepared from other sources and is so prepared commercially by such well-known chemical manufacturers as Monsanto and Mallinckrodt. The ethyl vanillin is somewhat cheaper to use, but some extract makers think it is hardly as good, although they concede it would take an expert to distinguish between the two. Due to labor shortage and to the effort to use all equipment to greatest advantage ethyl vanillin has been urged on those who have been accustomed to using some vanillin.

VANILLIN

There are no readily available figures on the scarcity of vanillin other than that it is difficult to get. The military services have purchased considerable amounts and due to shortage of the vanilla bean the normal demand for it has increased. The chemicals used in its manufacture have become scarce, also, because of their need in the manufacture of war supplies. While there is no abundance of vanillin the manufacturers assure the trade there is sufficient for legitimate use.

SYNTHETIC FLAVORING

Another class of materials that has come on the market has been used to make an extra go further. It would perhaps be incorrect to term them as substitutes. They are "stretchers" and have been designed for dilution of the extract without decreasing its strength. In times of plenty the use of such products would be frowned upon by the inspector in those states requiring the use of pure vanillas. The flavoring materials used in these products are largely vegetable extractives and in the better ones so closely resemble vanilla extract that the man on the street cannot tell the difference. While this is true it should be remembered by the manufacturer that they are temporary palliatives useful in an emergency and not satisfactory to the inspector during normal times. In this connection the war has so intensified research in the chemical industries that some startling gains have been made in the discovery of basic synthetic flavoring materials. It will be surprising, rather than otherwise, if some revolutionary chemicals in the flavoring field are not synthesized.

ADEQUATE VANILLA SUPPLY

The situation relative to vanilla flavors is on the whole reassuring as to an adequate but not a plentiful supply. Shipping conditions are less serious but still sufficiently serious that with labor and material shortage low prices cannot

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be expected. There may be temporary shortages but it would seem that the manufacturer will not be hurt to a degree greater than at present. In view of this day to day living it is well that he increase flavors that may be made to reduce the strain on vanilla and that he regulate all flavors in proportion to the plentitude of flavoring extracts available.

SHORTAGE OF FRUIT FLAVORS

The story of fruit flavors is about the same, possibly worse, than that for vanilla. A line should be drawn between fruits and fruit flavors in ice cream. Fruit used as the sole flavoring material in ice cream must be warmed in the mouth and chewed before its flavor is released. For this reason fruit ice creams are accompanied usually with flavor, preferably a true fruit flavor. The industry is at the end of true fruit flavors. True fruit flavors are made from fruits; fruits are starvation scarce; and true fruit extracts are consequently even more scarce.

CONCENTRATED FRUIT FLAVORS

Concentrated fruit juices, except cherry, from which true fruit flavors are made are available only to the extent of about 25 per cent of the demand. The manufacturer had the alternative of selling this small amount as such or mixing it into a compound to make as much as possible of a fairly good product. Obviously the latter course was chosen. Strawberry, raspberry, and pineapple flavors have been shortest. New crops and new sources may change this. Some pineapple is coming in from Hawaii and Mexico holds out promise for pineapple.

CITRUS OILS PLENTIFUL

Due to relaxation of restrictions there is at present no problem of a shortage of citrus juices. California and Florida have so improved their methods that their lemon and orange oils are definitely competitive with the Sicilian. As to pure citrus flavoring extracts the situation is pleasantly promising.

Drug for Black Fever

Because of military demands for a drug to combat kala-azar, a fatal infectious disease sometimes called "black fever," and lymphogranuloma, a venereal disease, also known as "tropical bubo," the Winthrop Chemical Company, Inc., has recovered the secret of Neostibosan, and is now producing this former German compound from all-American intermediaries, according to an announcement by Dr. Theodore G. Klumpp, president.

The drug is described as "an extremely complex ethylstibamine pentavalent antimony compound," and, while it has been in use in tropical medicine since 1927, has never before been made in this country. Dr. A. E. Sherndal, vice-president of Winthrop at the Rensselaer plant, was given the neostibosan problem about two years ago.

Only a description of the drug, not a complete formula, was in the possession of laboratory workers, who, commencing in May 1942, "unravelled the mystery" within a year's time, enabling the company to consider manufacture of the compound on a reasonable scale last year. At present, demands of the armed forces are being met, according to Dr. Klumpp, and experiments have started to determine whether the drug has other uses.

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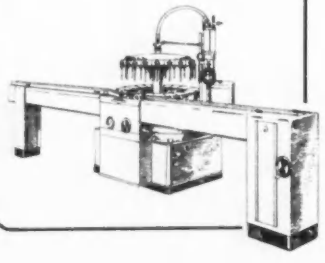

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Record Flavor Manufacturers' Meeting Planned

Thirty-fifth annual meeting to be held May 22 and 23. Experts will discuss Government Regulations, Paper Shortages, Alcohol. Federal agencies to be represented

E. L. Bredlinger
Secretary

Lloyd E. Smith
President

REGISTRATION FOR THE forthcoming meeting of the Flavoring Extract Manufacturers' Assn. to be held at the Hotel New Yorker, New York, N. Y., May 22 and 23, is already larger than the association has ever had at any previous meeting in its entire 35 years of existence. The program will probably be the heaviest the association has ever arranged and will cover the vital problems that affect the industry both now and in the years to follow the end of the war.

TO START MEETING AT 8:30 A.M.

Registration will begin promptly at 8.30 a. m., May 22. This will be followed by the address of President Lloyd E. Smith opening the convention, the roll call and the introduction of new members by George M. Chapman. E. L. Bredlinger will then report on the general program and John H. Beach will outline the business program.

Other important matters on the morning program will be the always informative report of the General Counsel, John S. Hall; the Treasurer's report by Leslie S. Beggs; the report of the Advertising Committee by John H. Beach; the report of the Membership Committee by George M. Chapman and two important papers: "The Food Color Situation" by W. B. Durling and "The Vanilla Bean Situation" by Ray Schlotterer, secretary of the Vanilla Bean Assn.

EXPERTS TO DISCUSS PROBLEMS

After luncheon, Paul S. Willis, president of Grocery Manufacturers of America, Inc., an old and respected friend of the association, will discuss "Government Regulations to Date." Questions will also be answered. William W. Fitzhugh, president of the Folding Paper Box Assn., will tell of the difficulties of the container manufacturers in the light of the paper shortage. Gordon Peyton of the WFA will then give official information of pertinent interest and J. E. Misenhimer of the American Can Co. will point out highlights in the container situation. John Montgomery, president of the Essential Oil Dealers' Assn., will follow with a discussion of the situation in oils used by the industry.

In the evening the annual dinner will be held and will be featured by the address of Clyde Powell.

ALCOHOL SITUATION TO BE PROBED

The Tuesday morning session is scheduled to open at 9.30 a. m. with a report on the alcohol tax situation by George H. Burnett. Herbert P. McNally, chief inspector of the Alcohol Tax Unit, Second District, will explain drawback regulations and he will be followed by William H. Kennedy, assistant Deputy Commissioner of the Alcohol Tax Unit.

Leslie S. Beggs
Treasurer

John S. Hall
General Counsel

"The Essentiality of Flavor in a Well Balanced Diet" is the subject of the paper by Dr. Robert C. Hockett, scientific director of the Sugar Research Foundation. Milton Martin of U. S. Industrial Chemicals, Inc., will follow with an address on "Wartime and Post War Status of Industrial Alcohol." C. L. Lightfoot will discuss "Glass Problems" and at the luncheon, which will follow, L. F. Livingston will give his address on new products.

The afternoon session will be devoted to reports of various committees by chairmen William H. Hottinger, Jr., George M. Armor, William B. Durling, Garret F. Meyer and John N. Curlett and others; the adoption of resolutions and the election of officers.

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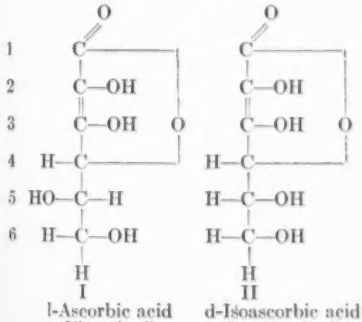
Fatty Acid Monoesters of l-Ascorbic and d-Isoascorbic Acids*

It was the purpose of the present investigation to synthesize and study the properties of fat-soluble monoesters of l-ascorbic and d-isoascorbic acid in which primary hydroxyl group was esterified

by DANIEL SWERN, A. J. STIRTON, J. TURER and P. A. WELLS

Eastern Regional Research Laboratory, Bureau of Agricultural Chemistry and Engineering, Agricultural Research Administration, United States Department of Agriculture, Philadelphia, Pa.

THE OXIDATION - REDUCTION properties of l-ascorbic acid (I) and d-isoascorbic acid (II) are well known,[1, 2] and recently it has been shown that l-ascorbic acid and related



l-Ascorbic acid Vitamin C — d-Isoascorbic acid Isovitamin C

substances may be valuable anti-oxidants for fats[3] and for oil-water emulsions.[4, 5] d-Isoascorbic acid should be available at relatively low cost, since calcium 2-ketogluconate, which is readily convertible to d-isoascorbic acid in good yield,[6, 7, 8, 9] is easily produced from glucose by fermentation.[10]

The insolubility of l-ascorbic acid and d-isoascorbic acid in dry fats limits their effectiveness as anti-oxidants for fats and oils. However, esterification of these acids with higher fatty acids to render them fat-soluble should increase their effectiveness provided that their oxidation-reduction properties are not adversely affected. It was the purpose of the present investigation to synthesize and study the properties of those fat-soluble monoesters of l-ascorbic acid and d-isoascorbic acid in which the primary hydroxyl group was esterified.

METHODS OF PREPARATION

Several methods were tried for preparing pure fat-soluble fatty acid monoesters of these ascorbic acids. The methods employed were;

1. Treating the ascorbic acid with the appropriate fatty acid chloride in the absence of a solvent, or in pyridine or pyridine-chloroform solution,

2. Heating the ascorbic acid and the fatty acid together in the presence or absence of catalysts,

3. Allowing the ascorbic acid and the fatty acid to react at room temperature in concentrated (95 per cent) sulfuric acid solution. Although the first method gave evidence of considerable reaction, no definite compounds could be isolated. By the second method no reaction was observed, and at least 90 per cent of the fatty acid was recovered unchanged. The last method was the only one that permitted ready separation and purification of the desired monoesters in good yield.

H_2SO_4 A SOLVENT AND CATALYST

Concentrated sulfuric acid as a solvent as well as a catalyst in esterification reactions has been employed in a limited number of cases since first proposed by Meyer.[11] Its most widespread application has been in the synthesis of glyceryl esters of fatty acids by Grün and coworkers[12, 13, 14] and it has also been employed by Bloor[15] to synthesize esters of mannitol and related carbohydrates with fatty acids. Grün has shown that none but primary hydroxyl groups take part in esterification in sulfuric acid when the primary hydroxyl groups are free. Since l-ascorbic acid and d-isoascorbic acid contain only one primary hydroxyl group each, one would expect only monoesterification to take place. The products isolated in this investigation were monoesters, and although no conclusive evidence has

*Reprinted from *Oil & Soap*, Nov., 1943, Vol. XX, No. 11, pp. 224-226.

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been found that permits us to state unequivocally that esterification took place on the primary hydroxyl group only, it will be shown that this was most probably the case.

Pure monoesters of l-ascorbic and d-isoascorbic acids were prepared from lauric, myristic, palmitic and stearic acids in 40 to 50 per cent yields. The esters where white crystalline solids, soluble in most of the common organic solvents, and in fats and oils on gentle warming. They were insoluble in cold water. At room temperature dilute acetone solutions of potassium permanganate were readily decolorized by dilute acetone solutions of the esters. When titrated in alcohol solution with standard aqueous alkali, these esters gave theoretical neutralization equivalents for monoesters containing one titratable acidic enolic hydrogen.

DETERMINATION OF PURITY

A method was developed for determining the purity of the esters based on the iodometric procedure for assaying l-ascorbic acid.[16] Since both the esters and the ascorbic acids can be titrated with standard alkali and iodine solutions, it may be assumed that the enediol structure of l-ascorbic acid and d-isoascorbic acid has remained unaltered in the esters. Esterification, therefore, did not take place in the enediol group but on one of the other two available hydroxyl groups. The esters prepared in the present investigation gave a positive furfural test,[17] indicating that carbon atoms one through five are unesterified unless it is assumed that under the conditions of the furfural test the ester is hydrolyzed. In the short time of contact between the 12 per cent alcoholic hydrochloric acid and the ester, little hydrolysis would be expected to take place. This leaves carbon atom six as the only one on which esterification had taken place. In view of Grün's[12] original work, it is highly probable that these monoesters of l-ascorbic acid and d-isoascorbic acid are esters of the primary hydroxyl group only.

Although we have usually found it convenient to operate with purified fatty acids, the less expensive commercially available mixtures of higher fatty acids served just as well. The products, of course, were mixtures.

A study of the antioxidant properties of these esters is in progress, and a detailed report will be given separately.

EMPLOYMENT OF MONOESTERS

In addition to their potential utility as antioxidants, monoesters of the type described in this aritcle may have utility as interfacial modifiers since they contain the necessary hydrophilic and lipophilic groups.[18] Interfacial modifiers are used to improve the stability of emulsions such as aqueous dispersions of fat-soluble vitamins, mayonnaise, oleomargarine, chocolate coatings and ice cream and to improve the quality of cakes, to mention but a few of the uses related to the food industry. Qualitative experiments on the emulsification of peanut oil and water have shown that a small quantity of the l-ascorbyl or d-isoascorbyl ester prevents the emulsion from breaking for a considerable length of time.

The esters of l-ascorbic acid described above may have antiscorbutic activity because the structures to which this activity is attributed have presumably remained unaltered. Where l-ascorbic acid itself is unsuitable as a source of vitamin C these esters may find application. In addition, a fat-soluble form of vitamin C may be advantageous in certain vitamin preparations. d-Isoascorbic acid is reported to possess from one-fortieth to one-twentieth as much antiscorbutic activity as vitamin C.[19] Tests on the antiscorbutic activity of these esters are in progress.

EXPERIMENTAL

The purest products that could be purchased were used. They had the following melting points: l-Ascorbic acid, 188 to 190 deg. (decomposed); d-isoascorbic acid, 167.5 to 170 deg. (decomposed); lauric acid, 42 to 43 deg.; myristic acid, 52 to 53 deg.; palmitic acid, 61 to 62 deg.; stearic acid, 69 to 70 deg. The neutralization equivalents and carbon and hydrogen values for these compounds agreed with the theoretical values. l-Ascorbic acid and d-isoascorbic acid assayed 100 per cent.[16]

PREPARATION OF THE ESTERS

To a solution of 0.05 mole of l-ascorbic acid or d-isoascorbic acid in 100 c.c. of 95 per cent sulfuric acid at room temperature 23 to 25 deg., 0.04 mole of finely powdered fatty acid (lauric, myristic, palmitic or stearic acid) was added. In the case of lauric, myristic and palmitic acids the resulting mixture was shaken until complete solution was obtained. In order to dissolve the stearic acid, however, it was necessary to warm the mixture to 35 deg. The l-ascorbyl reaction mixture was allowed to stand overnight at room temperature, about 16 hours reaction time, whereas the d-isoascorbyl reaction mixture was allowed to stand for six hours. The solution was then poured slowly with continuous stirring on 500 grams of chopped ice, and the stirring was continued until all the oily liquid had solidified. When the mixture had reached room temperature, it was extracted with ether. The ether solution was carefully washed with water until the washings were free of sulfate ion. Stable emulsions that formed when the ether solution and the wash water were shaken together too vigorously were broken either by the addition of ammonium sulfate crystals or by allowing the emulsion to stand for several hours. The washed ether solution was dried over anhydrous calcium sulfate, and the ether was recovered. The dry, residual solid was ground to a fine powder and

Table I—Properties of l-Ascorbyl and d-Isoascorbyl Monoesters

Compound [1]	Neutralization Equivalent		Equivalent Wt. by Iodine Titration		Per Cent Fatty Acid Combined		Combustion Analyses Per Cent [2]				Melting Point
							Found		Calculated		
	Found	Calculated	Found	Calculated	Found	Calculated	C	H	C	H	
l-Ascorbyl[3] laurate	356.5	358.4	177.9	179.2	55.4	55.8	60.2	8.70	60.4	8.38	105.5-106.5°
d-Isoascorbyl laurate	360.0	358.4	178.8	179.2	56.2	55.8	60.1	8.23	60.4	8.38	78-79°
l-Ascorbyl myristate	383.5	386.5	193.1	193.3	59.7	59.1	62.3	8.92	62.2	8.87	110.5-111.5°
d-Isoascorbyl myristate	385.0	386.5	193.2	193.3	58.6	59.1	61.7	8.79	62.2	8.87	84-85°
l-Ascorbyl palmitate	413.2	414.5	206.4	207.3	62.4	61.9	63.3	9.24	63.7	9.24	116-117°
d-Isoascorbyl palmitate	413.0	414.5	208.1	207.3	61.8	61.9	63.5	9.21	63.7	9.24	88.5-89.5°
l-Ascorbyl stearate	441.7	442.6	222.1	221.3	64.0	64.2	64.9	9.56	65.1	9.57	117.5-118°
d-Isoascorbyl stearate	444.7	442.6	223.0	221.3	64.1	64.2	65.0	9.68	65.1	9.57	91.5-92.5°

[1] The data in this table were obtained on the anhydrous esters. The d-isoascorbyl esters were difficult to dry completely. They were heated at about 65° for one to two hours below 0.5 mm. to remove all traces of water.

[2] Semimicro analyses were made by the Analytical and Physical Chemistry Division of the Eastern Regional Research Laboratory.

[3] It has been suggested that these esters be named as derivatives of the ascorbic acids, for example, lauroyl l-ascorbic acid and lauroyl d-isoascorbic acid. This would be desirable from some standpoints since it would conform with the usual practice in sugar chemistry and would also indicate that the compounds still retain their acid function. Because of the probable application of these compounds in the chemical technology of fats, however, a name such as l-ascorbyl palmitate is more satisfactory, since it emphasizes the fat-soluble character of the compounds.

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washed by decantation with three 200 c.c. portions of petroleum ether (boiling range 35 to 60 deg.). Each portion of petroleum ether was stirred with the solid for several minutes before the insoluble solid was allowed to settle. These washings removed the small amount of unreacted fatty acid (10 per cent or less of the original faty acid), which was readily recovered and could be used over again. After the last washing, in order to obtain a product of analytical purity, the crude ester (about 70 to 80 per cent yield)[a] was crystallized to a constant melting point (one or two crystallizations) from a mixture of ether and petroleum ether (boiling range 35 to 60 deg.). This was effected by dissolving the ester in the minimum quantity of boiling ether. Petroleum ether was then added in small portions until a slight turbidity was obtained at the boiling point of the solution. The esters usually crystallized as needles or plates. A this point, some evidence was available that the esters were monohydrates. In order to obtain concordant analytical results, however, the finely ground products were dried for at least one hour at 60 to 65 deg. under reduced pressure (0.5 mm. or less) to remove the last traces of water. The esters were slightly hygroscopic, and in the isoascorbyl esters small quantities of water caused appreciable depressions of the melting points. The yields of pure products ranged from 40 to 50 per cent. Further quantities of esters could be obtained from the mother liquors. Table I gives a summary of the experimental data.

NEUTRALIZATION EQUIVALENT

About 1.0 gram of ester was dissolved in 100 c.c. of neutralized ethyl alcohol. The solution was titrated with standard 0.1 N aqueous sodium hydroxide solution to a phenolphthalein end point. The end point was approached rapidly, the first pink color that permeated the entire solution being taken as the end point. The pink color faded quickly.

IODINE TITRATION

From 0.3 to 0.5 gram of ester was dissolved in 100 c.c. of ethyl alcohol, and 25 c.c. of 10 per cent sulfuric acid was added. The solution was titrated with standard 0.1 N iodine solution, a 0.2 per cent starch solution being used as an external indicator. A blank titration was also run. The theoretical equivalent weight is equal to one-half the molecular weight, since two hydrogen atoms are removed from the enediol group of the ester during the iodine titration.

[a] These crude products were fairly pure and were satisfactory for most purposes. The d-isoascorbyl esters were pale yellow, whereas the l-ascorbyl esters were colorless.

FURFURAL TEST

The furfural test was carried out in the usual manner,[17] 12 per cent alcoholic hydrochloric acid being used as the solvent.

SUMMARY

Fat-soluble fatty acid monoesters of l-ascorbic acid, (vitamin C) and d-isoascorbic acid have been prepared from lauric, myristic, palmitic and stearic acids in 40 to 50 per cent yields.

Evidence has been presented to show that only the primary hydroxyl group of each of the ascorbic acids has been esterified.

Antioxidant properties of these esters are being studied.

Preliminary tests on the esters have indicated that they may have useful properties as interfacial modifiers.

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Soap Rationing Successful

THE CLAIM THAT soap rationing has been a complete success has been made by Geoffrey Heyworth, the Lever Bros. Unilever and allied concerns chairman. The rationing system, which has worked smoothly from the outset, has seen a continuous reduction in the consumption of oils and fats for soap preparation. In 1942 that saving was 18 per cent down and in 1943 rather more.

Concentration of the soap industry had also shown certain considerable beneficial effects, as for instance, the charges in their own group of companies. There, through interchange of manufacture, a saving of approximately six million ton-miles of transport was achieved by this one group alone. Such a statement, coming from the responsible head of one of the biggest soap groups in the world, argues that the scheme has proved a satisfactory one, not only to the consumer, but to the soap trade as well.

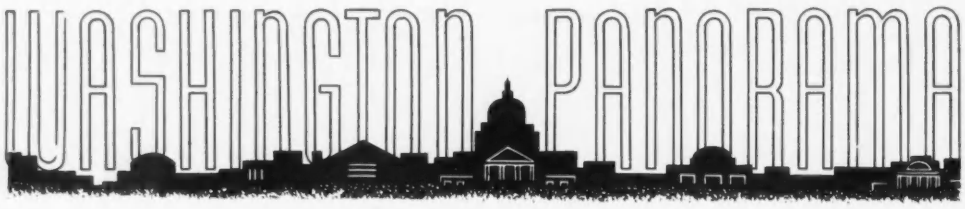
DEPLORABLE SITUATION

The soap position in Britain is meantime interesting. Although the private position is easy, and even plentiful, the public position is desperate. The immense thefts of soap from all public places has created a situation where no one responsible for a wash room, or toilet room, even contemplates leaving soap. It would be lifted inside of ten minutes. The chairman of the L. M. S. Railway Company, which was recently reported to be losing goods by thieving to an annual value of £1 million, recently stated in his annual survey that "it is now impossible to provide any easily removable articles such as towels and soap, without immediately losing them."

The net result of that statement is that railway wash rooms no longer carry these articles. Hotels and restaurants have either entirely banned the supply, or have only a limited amount available. Where an attendant is on duty the position is simplified, but generally the danger is one which cannot be guarded against. Losses occur even in offices and private hotels.

GOVERNMENT REGULATION

Prices have advanced slightly lately, and soaps are now all 1d. dearer per lb., with the exception of some branded types, which remain unchanged. It has also been made an order that the prices charged for soap powders shall be those which appear on the packets. In some cases there has been a tendency to sell such sought-after brands at higher prices than was listed. There has also been a tendency to make conditional sales whereby a housewife who bought a certain type of favored brand had to take something else which she did not really want. If she did not—next time, no special favored brand soap. That type of "conditional" sale has been very much frowned upon and the latest legislation will have the effect of making retailers who do practice it liable to serious court prosecution and heavy penalties.



by ARNOLD KRUCKMAN

WORKERS AND CONTAINERS are the chief troubles of this industry, as they are in practically all other industries of America. These were the subjects discussed at the WFA-OPA Essential Oils Industry Advisory Committee meeting and at the meetings of the WPB Dentifrice Industry Advisory Committee and the WPB Cosmetics and Toiletries Industry Advisory Committee. At the meeting of the WFA-OPA Essential Oils Industry Advisory Committee, late in April, a special task group was appointed to investigate adjustments in those areas where other industries pay higher wages, and similar problems. The Task Group consists of R. R. Webb, Bush & Co., Inc.; and F. T. Dodge, Dodge & Olcott Co. The Group will report at the next Committee meeting.

As a result of the representations by Elmer Tysdal, Chief, Cosmetics Unit, Chemicals Bureau, WPB, the earnest pleas of the people who attended the meeting of the WPB Dentifrice Industry Advisory Committee, are expected to bear fruit. It is expected the dentifrice industry, and probably other sections of the toiletries and cosmetics industry, will be given a higher rating to obtain containers, under P-146. At present the rating for fiber board shipping containers, supplied to the industries, is AA5. The new rating will probably be AA3. The AA5 rating practically meant nothing. It was known in Washington as the "catch-all." The AA3 is not essentially very much better, but it will give some standing to the relative preference of the industry. The only rating today that appears to have any real effect is AA1. It indicates the industry is doing work that is an essential part of the war. Obviously, from a realistic standpoint, no rating has much significance if there are no containers to meet the allocation. The problem of supplying containers rapidly is reaching the point where there will be little material for any wood or paper containers except those needed to ship things abroad. One of the insoluble problems stems from the V-boxes. Huge quantities are required and absorbed. They carry munitions and supplies to the armies, and to those who are receiving shipments from us in other countries. The boxes are a dead loss. None are returned. This means neither the boxes themselves can be re-used, nor can the material be salvaged for re-processing as waste paper or wood.

FACILITIES LIMITED

Government is sending more prisoners of war, and others, into the woods to cut the timber for container production, as well as for other needs. But apparently the actual supply of raw material, as well as the facilities and manpower for processing, is so limited that the deficit will grow for the next nine months despite all efforts. The relief will come only when the pressure for containers is relaxed by easing of the war needs. When that may be no one knows. The guesses in quarters that should have grounds for good guesses run from next year to 1947. There is an impression here that the dentifrice industry on the whole probably is doing fairly well in the matter of over-all container supply. It is anticipated the amendment to P-146, bestowing the AA3 rating, will come out soon. Those who need relief before the Order is issued can get it by filing with the Container Division WPB Form 2408, at the same time sending a copy to Elmer Tysdal. Mr. Tysdal will help to speed the application. It should be noted that it is important to send the copy to Mr. Tysdal.

The chief interest in the meeting of the WPB Cosmetics and Toiletries Industry Advisory Committee was in folding and set-up boxes. A Task Group was appointed to survey the situation. It consists of J. P. Danilek of Dorothy Gray Co., Manning O'Connor of Colgate-Palmolive-Peet Co., and Jewell Gordon of Nestle LeMoir Co. The report of the Group suggests an amendment to L-239 which might relax present limitations. It is very doubtful, however, whether or not the slightest relief can be had for anything that affects fibreboard, paperboard, or any kind of paper for cosmetics and toiletries. The opinion here is that small sizes may entirely be eliminated, that all types, including low and medium priced products, must be packed in larger units. Shipping must be confined to fibreboard boxes. Wood is entirely prohibited. And fibreboard boxes, now restricted to 60% of the number used in all likelihood will again be reduced. At present no substitutes are in sight. If any one can devise a substitute, the idea will be welcomed with enthusiasm by Government. An effort is now being made to adapt the textile bag to some uses hitherto confined to paper and wood. M-221 was amended late in April, the amendment specifically excepting from its restrictions shopping bags, carry-out bags, textile wrappings, and combination bags made of textile laminated with paper. Some beverage industries have already availed themselves of the relaxation in order to provide carry-out bags made of cotton or similar fabrics. WPB has created a special technical staff to explore the whole field in order to further reduce the use of fibreboard containers.

DISCUSSED ESSENTIAL OILS

The WFA-OPA Essential Oils Industry Advisory Committee met late in April under the chairmanship of A. L. Kalish, Chief of the WFA Essential Oils Section. Mr. Kalish's appointment as Chief of the Section was reaffirmed by a special Order of the day before the meeting. Apparently the action was designed to settle any doubt in regard to authority of WFA in the premises. At the meeting it was made clear that WFA based its control of essential oils on its legal authority over food problems during the war. Any essential oil that in any manner is used in connection with any food, including beverages that come under the food classification, comes under WFA regulation. This construction leaves few essential oils outside of

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U.S.I. CHEMICAL NEWS

May ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1944

Alkyd Allocations Tightened Further

New Resin Specifications Can Be Met with Other U.S.I. Products

Heavy military demand for certain products requiring phthalic anhydride in their manufacture have necessitated a reduction in the amount of this chemical allocated for use in alkyd resins. Thus it is predicted that alkyd resins will be allocated only for the most critical end uses.

Maritime Commission

The Maritime Commission is reported to have given notice that after May 1st the use of alkyd resins will be permitted only in their interior and exterior primers and in their low visibility exterior paints. S&W Aroplaz 1244, U.S.I.'s 52-MC-21 resin, will, therefore, still be allowed for use in Maritime Specifications 52-MC-23 and 52-MC-29 primers and S&W Aroplaz 1328 for use in MC-52-A1, Class XXII, red lead primer. S&W Aroplaz 1240, the 52-R-13 resin, will also still be allowed for use in exterior finishes such as Specifications 52-MC-5 and 52-MC-6. However, the majority of interior finishes will be based on an oleoresinous vehicle meeting requirements of Specification 52-MC-7. Arochem 365 is recommended for use in the compounding of this vehicle.

Armed Services

As a conservation measure, the Armed Service Forces also are revising many of their coating requirements. Many types of equipment such as tool kits, first-aid kits, metal bins, tables, blitz cans, and other metal equipment, formerly finished with an alkyd primer followed by an alkyd finish coat, will now be finished with a single coat of Specification 3-181 enamel; olive drab, rust inhibiting. Aroplaz 1320 is the U.S.I. vehicle for use in this specification.

Other equipment such as wooden carrying equipment, desks, antenna masts, etc., formerly coated with one coat of each of Specification ES-680A, Classes 638, 101 and 204, will now be coated with one coat of ES-680A, Class 638 followed by a coat each of AXS-750 and AXS-752, semi-alkyd finishes. ES-680A, Class 638 can be formulated with U.S.I. Aroplaz 1323, while AXS-750 and 752 requirements can be met by the use of Aroplaz S-313 or a 50/50 blend of Aroplaz 1323 and a 20 gallon oil length Ester Gum C varnish.

The U. S. Navy Department Bureau of Ships is now considering the revision of their interior fire retardant paint Specification 52-P-22 to replace the alkyd with more available materials. No definite decision has been made on this as yet, however, so the 52-R-13 alkyd resin (Aroplaz 1240) will be the required vehicle until further notice.

Novel Anti-Freeze Use Protects Gas Pipe Lines

In the Louisiana natural gas fields, a pipe line company has installed alcohol injectors to guard against freezing of hydrates in the line, should the dehydration plant be out of service. About one gallon of alcohol per million cubic feet of gas is required to provide this stand-by protection.

Fast-Advancing Textile Field Steps Up Use of U.S.I. Products

New Finishing and Coating Processes Call for Ethanol, Acetone, Other Solvents and Chemicals

Wind- and water-proof materials for Arctic service, oil-proof fabrics for plane parts, shrink-proof socks for soldiers — these are but suggestions of how the products of a wide-awake textile industry are serving the war effort. Many of these new fabrics were developed to solve specific war problems, or to meet the shortage of rubber and other materials. With few exceptions, however, they are here to stay, despite the return of natural rubber and the lifting of other war restrictions.

Washable, dry-cleanable fabrics that remain water-proof and retain their soft handle will be standard for a wide range of clothing. Flex-resistant, non-flammable fabrics will upholster plane, train, and automobile seats. Crack-proof, leather-like cloth tippings will adorn shoes. Odorless, non-toxic cloth package liners will protect solid and liquid foods. Specialty textiles of almost limitless variety will contribute to the comfort, convenience, and economy of postwar living.

Application, Manufacture

In the application of many new textile coatings, such U.S.I. solvents as ethanol, acetone and ethyl acetate are indispensable. In the manufacture of the coatings themselves, dibutyl phthalate and other U.S.I. plasticizers and solvents play many essential roles. And, of course, in many of the older textile manufacturing and finishing processes, huge tonnages of U.S.I. products are consumed: acetone as the solvent in which Rayon and Vinyon are extruded; dibutyl phthalate for fiber lubrication; acetone and alcohol for making "fused" shirt collars and as degumming agents and dyeing assistants, etc.

That the field for further textile development is still wide open, however, is graphic-

(Continued on next page)

Uses Conduction Heating in Setting Plastic Glue

The use of high-frequency electric currents to *in*duce heat in hot-setting plastic glues, while relatively new, has reached a high state of development and is now much used in making plywood and other materials. A new development, however, is the use of *con*duction heating, as recently reported by a Canadian scientist.

There appears to be no limit in the size of wood which can be joined. And the time required is astonishingly short. Built-up wooden propellers, it is said, are "welded" in 5 minutes, an operation which formerly required 8½ days.

The plastic glue used in made electrically conductive by the addition of acetylene black which is said not to affect the strength of the joints.

Fog and Frost Preventive

A composition said to be effective in preventing the formation of fog and frost on windows, goggles and other glass surfaces has recently been patented. The patent covers the use of an alkali, ammonia, or organic base salt of a sulfated higher alcohol, and a water-soluble solvent such as a 10 to 1 ethanol-acetone mixture.

What a contrast in style the Yeomanette of 1918 and the 1944 WAVE present! The contrast in the textiles of which their uniforms are made is almost as great. The success of the textile industry in developing more serviceable, more suitable fabrics is reflected in wide range of war products—from uniforms to tank tarpaulins.

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May ★ **U.S.I. CHEMICAL NEWS** ★ 1944

Textile Field

(*Continued from preceding page*)

ally shown by a review of recent patents. Here are listed a few of the more interesting ones involving U.S.I. products:

Waterproofing

In the water-repellent coatings field, one patent describes the synthesis of such compounds as hexane-bis (*N*-octadecylamidomethylenepyrinidium chloride) and their application in ethanol solutions to impregnate cellulose textiles. Another covers a water-in-oil emulsion containing butyl alcohol, along with a solvent-soluble urea-formaldehyde condensate, solvent-soluble ethyl cellulose, a water-insoluble wax, and an aluminum soap.

A third patent in this field describes the dispersing in ether of a gel formed from a benzene or naphtha vehicle and an aluminum soap, and mixing with a volatile vehicle — for waterproofing felt hats. For both felt and straw hats, a patent awarded to the same inventors covers the dispersion of a similar gel by a peptizing agent such as acetone. A fifth important patent covers the use of an emulsion of an ester of a cellulose ethyl ether in volatile organic solvent, so as to leave an insufficient amount of impregnating material to form a continuous coating over the textile. In still a sixth patent, anhydrous ethanol serves as the reaction medium in the production of polyguanidines for improving the dyeing properties and water repellency of fabrics.

Shrinkproofing

The shrinkproofing of wool with alcoholic caustic potash, recently described in these columns, is another development of interest. Up to 65 percent reductions in the felting shrinkage of wool socks have been made without significant loss of strength.

Mothproofing

Numerous recent patents of mothproofing agents involve the use of U.S.I. solvents. One, assigned to the Government, is isonitrosoacetanilide in acetone solution, along with various other compounds.

Another patent calls for the use of butanol in a method for treating fibers to facilitate impregnation with fungicides. A British patent on laminated fabrics suggests ethanol as the solvent for the plasticizer. Two German patents for increasing the elasticity of acetate rayon describe a mixture of ethyl acetate and chloroform as the treating agent.

An American patent on the stabilization of knitted cellulose fabrics (to prevent shape distortion in use) employs a condensate of urea, formaldehyde and ethylene glycol or ethanol. Another on the treatment of airplane fabrics to prevent damage from gasoline, etc., names ethanol as one of the solvents for the film-forming agent; the fabric is shrunk into place on its mounting as the solvent evaporates. Dibutyl phthalate can serve as the plasticizer in yet another patent on the finishing of fabrics with ethyl cellulose — to impart soft handle and imperviousness to moisture and air.

Acetone Employed in Extracting Vitamin K

Alfalfa, chestnut tree leaves, and pig livers are used as the source of vitamin K in a process developed by a Russian scientist and recently reported in an English journal. The process involves the extraction of the vitamin with acetone and subsequent purification to remove colored substances and other unwanted constituents dissolved out by the acetone.

The extract is first heated and treated with petroleum ether and with 90 per cent methanol, and the methanol extract discarded. The ether fraction is transferred into alcohol and cooled to 0 C, and the resulting precipitate filtered out. The filtrate is then evaporated and the remainder treated with petroleum ether and 90 per cent acetic acid. Again the ether fraction is transferred into alcohol, cooled with "Dry Ice" and filtered. The fatty fluid resulting contains about 36 per cent of the vitamin K originally present in the starting material.

A. J. Wittenberg Resigns as Vice-President of U.S.I.

U. S. Industrial Chemicals, Inc. announces with regret the resignation, as of April 14, 1944, of Mr. A. J. Wittenberg, Vice-President of the Company and Director of the Stroock & Wittenberg Division.

Mr. Wittenberg joined the Company in 1938 when the Stroock & Wittenberg Corporation became a wholly owned subsidiary of U.S.I.

To further consolidate U.S.I.'s plans for expansion, development and diversification in the chemical field, the natural and synthetic resin business of Stroock & Wittenberg, with the same personnel and offices, was sometime ago made an integral part of U.S.I. and is being conducted in the name of U. S. Industrial Chemicals, Inc.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

The unpleasant odor of cod and other fish liver oils, it is claimed, can be masked or effectively modified by a new product now being offered to manufacturers of cosmetics, etc. **(No. 809)**

U S I

A molasses distillers product, in liquid form and containing 45 per cent solubles, has recently been made available without allocation requirements. The product is claimed to have possibilities as a sticking agent or binder for various industrial uses. **(No. 810)**

U S I

Anti-corrosion films, for highly polished steel surfaces, can be obtained with a new product which is diluted with acid-free mineral oil and applied cold, according to the maker. The new coating is said to pass standard tests against hydrobromic acid, salt spray and humidity. **(No. 811)**

U S I

Ethyl chloroacetal is reported to be available in 1 to 12-gallon glass containers for use in organic synthesis and the preparation of medicinals. A stable, water-white liquid, the product has a boiling range of 150 to 158 F and mixes with most organic liquids. Not miscible with water, glycerol, and higher aliphatics. **(No. 812)**

U S I

A portable infra-red unit has been developed for making "on the spot" heating and drying tests of chemicals, plastics, coatings, etc. Supplies from 70 to 400 F, operates on a-c or d-c. **(No. 813)**

U S I

A new vitamin test kit is described as providing fast, accurate determinations of vitamin A in fish liver and other types of oils. Utilizes extremely sensitive colormetric reaction. **(No. 814)**

U S I

Cleaning Metal Surfaces, after magnafluxing, is said to be facilitated by a new solvent of neutral pH and negligible toxicity. The rate of solvent recovery being high, the product should provide an economical means of removing oil and dye to provide a clean surface for painting, rust-proofing, etc. **(No. 815)**

U S I

Stabilized dicalcium phosphate dehydrate, recommended by the maker for medicinal uses and as a mineral substitute for foods, or a polishing ingredient in tooth pastes, is announced. Product is reported to retain water of crystallization and to remain free flowing during long storage under abnormal conditions. **(No. 816)**

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Diethyl Phthalate

OTHER ESTERS
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Diethyl Carbonate
Ethyl Chloroformate
Ethyl Formate

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Acetoacet-ortho-anisidide
Acetoacet-ortho-chloranilide
Acetoacet-ortho-toluidide
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WFA jurisdiction. Only those which may be defined as purely chemical or pharmaceutical, will thus be left in charge of WPB Chemical Bureau. WFA represents the United States on the Combined Food Board. The essential oils are represented on the Combined Food Board by a section headed by Mr. Kalish. This section, subject to approval of the Chairman of the general Combined Food Board, determines the allocation of the essential oils available abroad for importation, among the nations represented on the Board. For instance, in the case of lemon oil, the representatives of Great Britain, Canada, Russia, and any other nation represented, make an agreement concerning the quantity to be allocated to the various nations. After this bargain is struck, WFA, through Mr. Kalish, certifies to FEA the quantity of oil that is available as America's share in Sicily or elsewhere, and authorizes FEA to negotiate its purchase and transportation to the United States. The price, obviously, is determined by consultation between WFA and OPA. When the oil is brought to the United States through the U. S. Commercial Corporation, subsidiary of FEA, WFA, again through Mr. Kalish, issues a directive which authorizes FEA to distribute the oil to claimants in this country. The quantity allocated to each claimant is fixed by the WFA directive. It is deemed likely this system of distribution in the United States will be based upon the record of previous end-uses, and that the import houses, which heretofore have brought the oil into the United States, will be constituted agents for the Government in distributing the oil to those who use it in producing the end-use wares consumed by the ultimate users. It also is deemed likely that non-food essential oils, not used as pure chemicals nor pharmaceuticals, will be handled by FEA under authority delegated by WPB.

The members of the Committee requested a report on the proposed distribution of the lemon oil expected from North Africa and Sicily. The report is to be made by a Task Group not later than May 15. In all likelihood the report itself will not be available for publication until late in May. The Task Group appointed consists of P. C. Magnus, Maybee & Reynard, Inc.; H. P. Wesemann, Fritzsche Bros., Inc.; Dr. H. J. Kohl, Norda Essential Oil and Chemical Co.; R. R. Webb, Bush & Co., Inc.; and F. T. Dodge, Dodge & Olcott Co.

LABOR PROBLEM

Manpower is steadily growing scarcer. In the plastics industry, 90 per cent of which is devoted to direct production for war, skilled, semi-skilled, and expert help, has been taken into the Army and Navy in such numbers than 85 per cent of the personnel now is composed of women workers. The ratio of men, usually over-age and 4Fs, is about 1 to 20 women in the processing plants.

The laundry industry, not classified essential by Selective Service, has lost its key men in such numbers, that Selective Service has permitted the industry to be placed in the "locally needed" bracket in order that the absolutely essential services in congested areas may be properly performed. An industry "locally needed" is entitled to justify its retention of workers without whom it would have difficulty in maintaining service. Draft boards are authorized to defer those who come under the "locally needed" classification. Deferment of workers still lies almost wholly with the local draft board. If a job or an industry cannot be justified to the draft boards, there is small chance of securing a deferment. It has been suggested here many employers fail to recognize that often the decisions of draft boards depend upon the permanent full time employees of the draft boards who keep the records and become fully acquainted with the registrants and their employers when they appear in the draft board offices. Unquestionably some men have been inducted because neither the registant nor the employer have taken the time to sell their reasons to the full-time staff members who are the buffers between the board and the public. The employer should realize deferments chiefly depend upon his ability to demonstrate that he has tried diligently but cannot find replacement for the man he wishes to retain. No men are now to be deferred, from 18 to 37, unless the boards are absolutely convinced the employer has done his utmost to find a substitute. Special objects of induction after July 1 will be all men from 26 to 30. The 4Fs still remain least likely to be affected, with 2-Bs and 2-As coming next. Of course, the workers at present least likely to be disturbed are those over-age or women. The over-age might be impressed by the labor draft if the armed services finally succeed in selling their ideas to Congress. If the war goes slowly, stretches to the length already suggested by some military men, the labor draft will probably be instituted. There is little likelihood of any law in this direction until next year. No candidate for election would actively sponsor the suggestion, prior to the next election. The most immediate development, which might disturb your workers is the WMC program to survey the men in the age bracket between 38 and 45. When the survey actually is started many persons will become uneasy and may hurry to find war jobs. The survey may be launched any time.

NWLB APPROVAL

If you wish to raise wages or salaries it is necessary to make application to Collector of Internal Revenue in your district upon forms provided by the local office, or by the Commissioner of Internal Revenue in Washington, D. C. The forms are designated as SSU-1, Revised, and SSU-2. Normally a raise is permitted within 15% without formal approval. However, it is wise to consult the Collector's office on the details before making increases. It also is required that approval be obtained from the Regional Office of the National War Labor Board. A recent announcement stated that NWLB will not allow raises in an existing rate range or establishment of new rate ranges where none had previously existed when such raises involve the hiring of more than 25% of the new employees in the new or higher rated job classifications. The rest of the new employees must be hired at the old minimum. New establishments or new departments may employ as many as 50% of the new workers at rates above the minimum of an approved range for particular job classifications. Complete details about regulations governing raises are published in connection with Release B-1466, issued by the Office of War Information, on behalf of the War Labor Board. If you wish to obtain a copy, address Office of War Information, Washington, D. C.

INCREASED PRODUCTION EXPECTED

Office of War Information recently issued a statement with the declaration that cosmetics and toiletries this year will be limited by containers only. It anticipates the only real shortages of raw materials will be limited to alcohol, isopropyl alcohol, and lanolin. Incidentally, the supply of lanolin for May and June will be broadly about the same as it was in March and April. Lipsticks are to be cased in steel by manufacturers who have appealed from the limitations of WPB Order M-126. The largest number of compacts, lipsticks and rouge containers are expected to be made of plastics. Generally speaking, paper containers for these purposes have proved unsatisfactory. Lipsticks are particularly regarded as more certain of increased production because castor oil is now unrestricted. Brazil, among others, is sending us its surplus of castor oil. Only manpower is considered as the possible check on production of face powder, leg creams, cream colognes, rouge, synthetic perfumes, hair dies and hair tints, and deodorants. Solvents and plasticizers

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for nail polish are almost completely lacking. Glycerine, being unrestricted, is deemed the reason for a better production of a higher grade of tooth pastes. Metal foil is the sole reason there may be any limitation on production of permanent wave solutions. Government predicts an enormous sale of liquid stockings, solid perfumes (resembling a cake of soap), solid colognes, cake make-up and cream colognes and home permanent wave sets. The solid toiletries obviously stem from the lack of alcohol. It is reported cream colognes, while popular, do not have a market comparable to colognes with an alcohol base. There seems to be some doubt in the mind of Government officials whether or not sufficient paper will be available to supply boxed containers for talcum, bath powder and face powder.

COSMETIC SALES DOUBLED

Aluminum may be used for tooth paste tubes at the rate of 75% of the amount used in 1941. Tin is allocated at the same ratio. There is no restriction on the use of lead for shaving cream tubes. Roughly, according to the Office of Internal Revenue, the sale of cosmetics has doubled since 1939. Last year it was in excess of $600,000,000. Price control under MPR 393, Packaged Cosmetics, covers 200 types with 5,000 trade names. Government made a point of stressing to the ultimate consumer that while he will pay more for his cosmetics and toiletries, the increase is not due to higher prices but to a jump in taxes. OCR made a sampling survey of women's preferences and found 67% over-all deemed face creams most important. Face powder came second, and came first with women over 25. Lipstick was third. It was found that most women bought lower-priced cosmetics. Approximately 120,000,000 lipsticks were sold in 1942 of which 80% were the ten cent packages while the 20,000,000 cost a dollar or more. The survey showed that the average woman worker spent $2.37 a month on cosmetics in 1942. In 1943 it is estimated the sum had risen to $3.00 per month. Incidentally, it was found far more men now buy lotions, face talc, and body powders.

Oleic acids are now free of restrictions and the relaxation will materially ease the difficulties of shampoo manufacturers. Fats and oils are much more plentiful. Any cosmetic manufacturer who uses edible oils—peanut oil, corn oil, cottonseed oil, soyabean oil, etc.—obviously uses ration points which heretofore have been supplied by OPA. Hereafter they must be obtained from WFA. The use of these oils is expected to diminish, since castor oil has been freed of restrictions. Isopropyl alcohol is entirely denied for any toiletries use, ethyl alcohol is growing scarcer; but it is anticipated it may be easier during October, November, December. The allocations of cellulose acetate for the lipstick industry was increased by 100,000 pounds in April over March.

MPR Order 13 fixed the price of menthol f.o.b., duty paid, imported and purchased abroad, at $15 per pound. Importers may sell to industrial users or repackagers, 500 pounds or more, $16.50 per pound; 100 to 500 pounds, $16.75 per pound; 10 to 100 pounds, $16.90 per pound; when sold by repackagers to wholesalers and industrial users, 10 pounds or more, in 1 pound containers, $20.82 per pound; ½ pound containers, $20.92 per pound; ¼ pound containers, $21.00 per pound; 1 ounce containers, $22.10 per pound. Sold in less than 10 pound lots in 1 pound containers, $20.87 per pound; ½ pound containers, $20.97 per pound; ¼ pound containers, $21.05 per pound; 1 ounce containers, $22.10 per pound. Sold by wholesalers to industrial users and retail druggists the prices are $27.13 per pound; $13.63 per half pound; $6.64 per ¼ pound; and $1.80 per ounce.

Oil of cedarleaf or oil of spruce, used as odorants in soaps, were placed under a ceiling of $2.25 a pound for producers, and from $2.65 to $3.34 a pound for dealers. Dealers' prices depend upon the quantity packaged in a single container. The ceilings are set up in Amendment 2, MPR 472. Tertiary butyl alcohol for perfume bases and for cosmetics was allocated by WPB at 25% of the quantity requested. Pine tar, used in soap, has been placed under complete allocation by WPB.

WPB by amendment of Order M-63 removed from import controls the following: orange flower or neroli oil; orange oil, including mandarin; terpeneless orange oil, including mandarin; copal gums; steatite talc; vanilla beans.

WFA purchased for Government account in February 50,820 pounds lemon oil; 30,000 pounds peppermint oil; 500 pounds sassafras oil.

March excise taxes collected on toilet preparations totaled $2,595,294.65.

To relieve the lemon oil shortage for civilian needs it has been suggested by some WFA officials that the military requirements and the lend-lease requisitions should be reduced. It is understood negotiations for that purpose have been tentatively initiated by WFA officials of the Fruit and Vegetables Branch.

The full list of members of the WFA-OPA Essential Oils Industry Advisory Committee is as follows: F. G. Buehler, George Lueders & Co.; Gerard J. Danco, Gerard J. Danco, Inc.; F. T. Dodge, Dodge & Olcott Co.; F. W. Heine, Compagnie Duval; Walter H. Jelly, Walter H. Jelly Co.; Dr. H. J. Kohl, Norda Essential Oil and Chemical Co.; Dr. Eric C. Kunz, Givaudan-Delawanna, Inc.; Percy C. Magnus, Magnus, Maybee & Reynard, Inc.; R. R. Webb, W. J. Bush & Co.; H. P. Wesemann, Fritzsche Bros., Inc. Neither Dr. Kunz nor Mr. Magnus were present. They were represented by Messrs. R. M. Stephenson and George H. McGlynn, who were recorded as non-participating guests without power to vote or discuss.

A note on the oxidation of o-cresol to salicylic acid by alkali fusion. David E. Bland. *Australian Chem. Inst. J. & Prod.*, **10**, *239-42 (1943)*—High yields of salicylic acid (I) reported by Lock and Stitz, by fusing o-cresol with sodium-potassium hydroxides were not confirmed. The maximum yield of 30% was obtained by heating ten hours at 250°, five rours at 300°, or one-two hours at 330°. Addition of various catalysts did not improve this yield. Decomposition of I during alkali fusion was demonstrated, e.g., 27.5% loss in five hours at 300°. The following procedure is preferred and yields 30-40% of I: Grind o-cresol with three times its weight of sodium hydroxide to a dry powder. Heat in a nickle crucible for three hours at 250°, stirring frequently. Dissolve in the min. amount of diluted hydrochloric acid, cool, filter off and recrystallize from water. Through *C. A.*, **38**, *342, 1944.*)

Irritant Vapors—An Apparatus for the Application of, to the Skin. R. R. McNary. *Arch. Dermatol. Syphilol.*, **48** *(1943), 173.*—An apparatus is described which enables the research worker to apply irritant vapors to the skin quantitatively. Two pictures and a diagrammatic drawing are included (Through *J. A. Ph. A.*, **33**, *80, 1944.*)

Reclaimed friends, like reclaimed rubber, always seem more valuable in times of need.—*Howard S. Neiman.*

A man is not as old as he looks but as young as his laughter.—*Howard S. Neiman.*

If we had everything we want, we would not want everything we have.—*Howard S. Neiman.*

3 NEW PRODUCTS

1—a new absorption base—
SORBOTEX 301

The water absorption of this base is exceptionally high; greater than that of cholesterine absorption bases. Sorbotex 301 makes white, stable water-in-oil emulsions that will neither separate nor darken. Small additions to oil-in-water emulsions improve texture and increase stability.

Suggested uses: night creams, cold cream, ointment bases, permanent wave preparations, and similar products. Can also be used as an extender for Lanolin.

2—a new dispersing agent—
DISPERSOL 31

This new synthetic organic solvent and dispersing agent for dyes and pigments has considerably greater solvent action than Castor Oil. It is miscible with all vegetable and mineral oils and waxes. Will not turn rancid.

Suggested uses: for dissolving Bromacid and lake colors for lipstick and cream rouge. May be used as a complete or partial replacement for Castor Oil without change in balance of formula.

3—a new emulsifier—
CERASYNT IP

This is a new self-emulsifying wax that stabilizes emulsions containing large percentages of strongly alkaline or acid-reacting electrolytic substances.

Suggested uses: deodorant and permanent wave creams, water soluble ointment bases, etc.

Samples of any of the aforementioned products will gladly be sent upon request.

VAN DYK & COMPANY
INCORPORATED 1904

Manufacturers of Perfumery and Cosmetic Raw Material since 1901

Offices, Factory, and Laboratories: Main and William Streets, Belleville 9, New Jersey
Western Office: 1282 Sunset Boulevard, Los Angeles

Our aim is to offer quality and service in the creation and manufacture of your line of toilet preparations for current and post-war needs.

TRECE LABORATORIES
819 Broadway **New York, 3, N. Y.**
GRamercy 3-6917

War Check List—Government Regulations

Digest of Federal rules and regulations on price control, allocations and other regulatory measures of cosmetic, soap and flavoring industries issued or proposed during the past month

NEW WASHINGTON UNIT FORMED TO HELP SMALL BUSINESS IN MARKETING

The Department of Commerce has set up a new division whose major function will be special studies of competitive marketing and merchandising.

The new division is headed by Quincey Adams. Competitive marketing problems are under Wilford L. White. He has been a marketing specialist for years. The second unit which is devoted to management and finance is under the supervision of William Shepardson. Mr. Adams has been active in government circles since 1940, before that time he was manager of Dunn's Review, and manager of the Sales Research Department of Dunn & Bradstreet.

CANTAINER BOARD IN TRANSIT PRIOR TO APRIL 1, EXEMPT FROM AUTHORIZATION

Container board which was in transit to a person prior to April 1, 1944, may be accepted by that person without authorization from the War Production Board. The container board need not be charged up to the amount the consignee is authorized to receive during the second quarter of 1944.

Container board which was in transit prior to April 1, may be delivered to the person even though his order has not been accompanied by the certificate required by Paragraph D of Order M-290.

COSMETICS GIFT SET PRICING METHOD EXPLAINED BY OPA

The Office of Price Administration has amended, through order MPR393, the method of pricing gift sets.

Add the cost of the accessories, multiplied by 1.33, to the cost of the gift set container and the direct labor cost of assembling the set. Multiply the resulting figure by the largest mark-up used for any class of purchaser. To determine the mark-up subtract the largest trade discount granted from one hundred, and divide the result into one hundred.

Add together the accessories, container and labor costs, and the retail price ceiling, the result is the retail price ceiling. The retail price may be set at this figure, or any less figure selected by the manufacturer.

When the cost of the containers is extremely high in comparison to the cost of the cosmetics the gift sets must be priced under Consumer's Goods Regulation MPR188.

CONTAINER MACHINERY LIMITED, BUT PARTS ARE UNRESTRICTED

This new limitation order restricts deliveries of new, used and reconditioned container machinery, but does not restrict delivery of repair parts. The order requires manufacturers to file monthly operations reports.

NEW ISOPROPYL ALCOHOL CONTROL IN EFFECT

Isopropyl alcohol has now been placed under General Allocation Order M-300 (Appendix A, Schedule 12). Delivery and use of isopropyl alcohol by producers and distributors, as well as use, delivery and acceptance by any person will be authorized on the basis of this Allocation Order.

SOAP MANUFACTURERS ARE PLACED UNDER NEW RESTRICTIONS

A new order has been released governing the use of fats and oils. New percentages permitted to manufacturers are: package and bar soap 90% of average quarter, bulk package soap 110%, abrasive hand soap 150%.

Unused part of a quarter may be carried forward and used in the succeeding quarter, after the regular quota for this quarter has been exhausted.

Not included in this order is soap to the Armed Services, or soap for laundries contracting for these services.

Manufacturers who feel that this order places them under exceptional hardships may petition in writing the Director of Food Distribution, War Food Administration, Washington, D. C., referring to FDO42.

NEW PRICE CEILING ON MENTHOL GOVERNS IMPORTS

An import price ceiling of $15.00 per pound, duty paid, f.o.b. any port of entry in the United States has been placed on menthol. Purchasers of menthol by irrevocable letter of credit prior to April 17 are exempt from this ruling. The new price comes under order No. 13, Section 21 of the Maximum Export Price Regulation.

The importer is held to a maximum resale price of $16.50 in 500 pound lots or over, $16.75 in lots of 100 pounds to 500 pounds, and $16.90 for 10 to 100 pound lots.

CONSUMERS MAY OBTAIN REALLOTMENT OF CONTROLLED MERCHANDISE

Secondary consumers who have returned an allotment of controlled merchandise to a claimant agency can now secure re-allotment of this merchandise. They may not receive more merchandise than was returned, however, and the time must be in the same quarter as that when the original allotment was made.

HOPE HELD THAT INDUSTRY MAY BE GRANTED HIGHER RATING

Paper savings, plus the moral uplift value of cosmetics, may possibly give the industry a higher than AA-5 rating. A point to consider is that cosmetics give the women in the various branches of service their only means of individual expression.

The industry should realize that, besides being a patriotic duty, paper salvage is one approach to securing more boxes.

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LUBRICATOR
FOR CLOTHING, WOOLENS & CLOTH

CED-R-WOOD

Spray this PLASTICISING *CEDAR-COATING* for PRESERVING Valuable Garments. Makes them SOFT, PLIABLE and Resistant to DRY ROT. Also keeps out MOTHS.

SPARHAWK COMPANY
SPARKILL • NEW YORK
U. S. A.

ISOPROPYL ALCOHOL

available for

SHAMPOOS: Isopropyl Alcohol aids in cleaning hair and scalp thoroughly and in leaving hair soft and lustrous.

HAIR AND SCALP PREPARATIONS: Isopropyl Alcohol as a vehicle for hair and scalp preparations aids the cleansing and antiseptic value of the tonics.

STERILIZING SOLUTIONS: 40% Isopropyl Alcohol will kill dried Bacillus Coli in 1/4 minute. 50% Isopropyl Alcohol is equivalent to 70% ethyl alcohol for killing Bacillus streptococcus and staphlococcus.

BODY RUBS: Isopropyl Alcohol evaporates slowly, thereby prolonging the cooling effect when used in body rubs. Isopropyl Alcohol has no denaturants.

FACE AND HAND LOTIONS: Isopropyl Alcohol evaporates slowly; has little tendency to dry the skin, and aids in keeping the skin soft.

AFTER SHAVE LOTION: Isopropyl Alcohol is excellent for this product because it aids the after-cooling and skin-freshening qualities of the lotion.

Use 91% Isopropyl Alcohol and Release War Materials

STANDARD ALCOHOL COMPANY
26 BROADWAY NEW YORK 4, N. Y.

Questions and Answers

Q.: *I would like to know where to get the artificial strawberry flavor mentioned in the January* AMERICAN PERFUMER. *In the meantime, please let us know which formula in the book, "The Chemistry and Manufacture of Cosmetics," which we bought from you is as nearly like Arrid as possible. If you could send us a sample formula for it, we would be glad. Could you also give us a formula for making up a good finger waving solution that could be retailed at about 15c. for a 2-ounce bottle.*

W. T.—TEXAS.

A.: Under separate cover we have advised you of the source of the strawberry flavor. Arrid is made from a patented formula. Even so, we cannot undertake to analyze Arrid for you or advise the best method of duplicating it. Too much research is involved. Formula No. 63 on page 263 of the book you mention produces a product that possesses anti-perspirant properties, but you should test it for safety to fabric, since it contains no buffer. Formulas given on page 443, and subsequent pages of the book, describe formulas for finger waving fluids, such as you are interested in.

Q.: We have been using a cold waving solution and find that the fingers of our operators are soft and touchy. Is there anything that we can use to prevent this?

R. J.—ILLINOIS.

A.: Your waving solution is quite probably some thio compound, particularly a *thio*glycollate. These are well-known sensitizers and the already large number of people sensitive to sulfite reducing agents is now agumented by this new increased professional hazard. The only thing we can suggest is that your operator use gloves at any time that her fingers come in contact with the hair and if the waving solution should get on her hands at all to be sure to rinse them in a little peroxide and vinegar and then in plain water and finally apply some healing lotion.

Q.: Will you please give us a formula that exactly duplicates Wildroot Cream Oil Hair Dressing?

T. T.—NEW JERSEY.

A.: It is not our policy to give formulas for any well-known product on the market, even if we knew it. However, we can and do make recommendations regarding a possible line of development. The product you refer to is an emulsion of the water-in-oil type that remains fluid under normal circumstances. The only materials that we know of that will give this kind of emulsion are absorption bases of one kind or another. Instead of using waxes and petrolatum, you will probably want to use mineral oil to retain your fluidity. However, since the manufacture of a fluid water-in-oil emulsion is one of the most impossible feats in cosmetic practice, you will undoubtedly have to conduct many experiments to arrive at a satisfactory formula.

Q.: We saw a recent trade letter quoting the Food and Drug Administration in regard to the possible toxic nature of phenyl mercury compounds which might be used in cosmetics in a concentration of 1:10,000. *Earlier, an article appeared in the* AMERICAN PERFUMER *implying that these materials were safe to use in cosmetics. Can you offer any suggestions?*

A. A. R.—ALABAMA.

A.: The recommendation in the AMERICAN PERFUMER article on the use of phenyl mercury derivatives in cosmetics was a concentration of 1:25,000 up to a concentration of 1:50,000. This is tremendously lower than the concentrations mentioned in the letter that was sent out by the Food and Drug Administration. Of course all mercurials should be used with caution, although there are a number of papers published to establish the fact that organic mercurials are considerably safer to us than inorganic mercurials.

MAISON G. deNAVARRE'S new book, "Production, Control and Analysis of Cosmetics," of which this issue contains the third installment, starting on page 103, meets a long felt need in the cosmetic field. The author has assembled a plentitude of data from many sources, as well as information evolved in his own laboratory and consulting practice in this new book. We feel that this book will emerge as a standard reference.

Q.: We are making an all-purpose cream containing a substantial amount of lanolin. For several months we have been unable to buy lanolin. We are now at a point where we will either have to stop making our cream or use something else. We have tried some absorption bases, but most of these do not seem to be available. In addition we do not get the same feel on the skin. Can you make any suggestions?

J. J. N.—NEW YORK.

A.: Absorption bases are practically your best substitute because they possess water absorption properties. However, not all of them behave in the same way. Under separate cover we are sending you the names of some that we have found to have more of the characteristic feel. In addition, we are sending you the names of a couple of lanolin substitutes which are also working out well. Mixtures of sorbitol oleate and other materials can result in a product that has a feeling reasonably close to that of lanolin. We are sending you the name of a supplier of this material who will undoubtedly have some suggestions to give you.

Production of fats and oils for 1943 is reported to have been 10,870,000,000 pounds, 9 per cent more than in 1942. Animal fats increased 6 per cent, vegetable oils 15 per cent, chiefly soybean oil. In 1944 an additional increase of 3 per cent is predicted, approximately 11,200,000,000 pounds gross.

The addition to a soap composition of a small quantity of a product obtainable by the reaction of an aliphatic ketone compound, such as acetone, with ammonium thiocyanate, prevents or greatly reduces deterioration and oxidation of the soap. In tests the reaction product was mixed in the proportion of 0.1 per cent with a pure white toilet soap stock containing 0.07 per cent free sodium hydroxide and 12 per cent moisture. It is said that the antioxidant is neutral in reaction and does not interfere with the estimation of the proper end point of the reaction in the manufacture of the soap.—*Abstract from Soap, Perfumery & Cosmetics*, **16**, *627, 1923.*

A new and inexpensive permanent wave kit is being produced by the Rolway Co., St. Paul, Minn., whose "American's Beauty Bargain" will sell for 25 cents. Distribution of the product has been taken over by National Merchandisers, New York sales representatives and distributors. The Rolway kit contains a permanent waving solution, neutralizer, hair set, 40 curlers, paper hood and set of directions.

PERFUMERS

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NEUTRAL SOAP

Laboratory controlled chemical and physical characteristics.

Adaptable to most formulas.

Made from refined oils—air floated fineness.

Better quality—at a saving.

POWDERED NEUTRAL SOAP

JOHN POWELL & CO.
112 East 32nd Street,
New York City.

New Products, Ideas and Processes

SYNTHETIC BEESWAX

A synthetic beeswax known as "B" wax offered by the International Wax Refining Co. is successfully replacing genuine beeswax in cosmetics, sales, ointments, emulsions and soaps according to the manufacturers. It is claimed to have excellent emulsifying qualities and to give a fine stable emulsion in creams and pastes especially with hot borax-water solution. Furthermore it is stated that it may be completely blended with genuine beeswax in any proportion, that it produces creams and paste of good texture and will not become rancid. It is packed in 8 lb. cakes in 50 lb. cartons. Chemical and physical properties of this interesting product are given in a booklet which will be sent to anyone interested. In it also are listed and described the company's Three Star brand ozokerite wax, a synthetic carnauba, numerous imported natural waxes, synthetic waxes, ozokerites, paraffin and amorphous mineral waxes, ceresines and miscellaneous waxes.

PRESERVATIVES

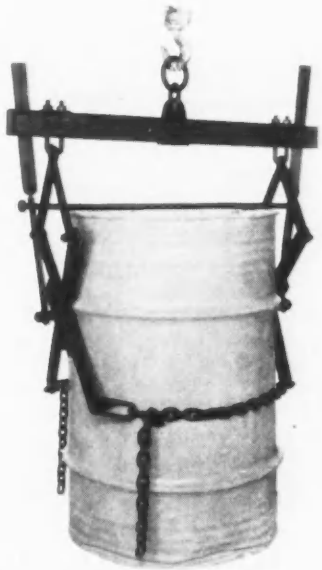
Preservatives stated to be of high antiseptic and germicidal power known as Chemosol and Chemogin are offered by the Chemo Puro Manufacturing Corp., 48th Ave. and 5th St., Long Island City, N. Y. Both are said to be easily soluble in water, alcoholic solutions, oils and fats, and are employed with success in numerous cosmetic preparations such as waveset lotions, tooth paste, creams, hand lotions, face powder, soaps, sunburn creams, ointments, mouth washes, lipsticks, etc. According to the manufacturer's description they are odorless, tasteless, non-toxic, and are non-iritating to the skin. Chemosol is offered for effective preservation use in aqueous solutions or materials containing water because of its solubility at every concentration; Chemogin is for oily or fatty preparations and a mixture of the two may be used in all emulsions. The firm has informed us that they will send samples and descriptive leafl- .o any one interested on request.

SCHIMMEL PRICE LIST X

Price list X covering essential oils, aromatic chemicals, resinoids and extrols, oleoresins and concentrates offered by Schimmel & Co. Inc., 601 W. 26th St., New York, N. Y., has been issued. Price list P covers perfume compounds and specialties and Price list C covers flavoring specialties. Any of the foregoing may be had by writing to the company.

NEW CANDY

The Whitman Candy Co. is producing in experimental quantity a new bittersweet rose cream. The new flavor, which has been pronounced pleasing, was suggested by Ralph Bienfang, Professor of Pharmacy, University of Oklahoma.



NEW BARREL LIFTER

Vertical and horizontal lifters to handle barrels and drums have just been placed on the market. The vertical lifter is lowered onto the barrel and then an encircling chain placed on a grab hook. The lifter opens automatically upon contact with the barrel or drum. Application and removal of both types is made in a matter of seconds.

WAR CONTRACT TERMINATION

A new manual has just been completed on the procedure of terminating war contracts. This manual gives, in graphic presentation, a suggested breakdown of terminal duties by departments. It illustrates practice-proved forms which are designed to expedite this work. It does not "interpret regulations."

The preparation of the book was suggested after it was reviewed by Chicago Ordnance, Army Service Forces at Washington, and the National Association of Manufacturers.

A copy of this book may be obtained without charge.

Announcements

Brand names research

Broad gauge research on brand names and trade marked goods in relation to business growth and quality merchandising is being undertaken by the Brand Names Research Foundation, sponsored by a group of manufacturers of widely known products. The research is aimed to provide information useful in bringing about a wider understanding of the part brand names and trade marks have had in the development of business, providing employment and safeguarding consumers in their buying.

Research on bathroom containers

How container size, available shelf space and packaging preference affects consumer purchases of items usually kept in the bathroom cabinet is brought out in a survey completed by the Home Makers Guild of America. The majority of women it was disclosed keep the following toilet preparations in the cabinet: mouth wash, eye wash, shaving lotion, tooth powder and tooth paste, and shaving cream. Due to lack of space only 50% keep hand lotions, baby oil or talcum powder in the bath cabinet. Preference was expresed for screw-on caps for bottles containing liquids and for bottles and jars with large openings.

Proprietary Ass'n will meet May 15-17 in New York

The withdrawal of ethyl alcohol from the excise tax list, when used in medicine, flavoring extracts or foods, will be one of the major items to be discussed at the 62nd Annual Convention of the Proprietary Association of America at the Hotel Biltmore, May 15-17.

When the present Revenue Act went into effect, it placed a tax of $17.10 per gallon on alcohol used for these purposes, with a drawback of $11.40, thus making the net tax $5.70 per gallon.

Bulletin on substitute waxes

Shortages of many mineral and vegetable waxes which has led manufacturers to turn to substitutes, replacements and extenders has led the Distributing & Trading Co. to issue a bulletin "Waxes for Today and Tomorrow" giving 36 different kinds of waxes together with specifications and prices to afford a ready reference to production chemists called upon to modify formulas or experiment with new ones. Copies of the bulletin may be had for the asking.

HOW MUCH LESS PAPER CAN YOU USE IN YOUR PLANT?

That's a mighty important question. Paper stocks are seriously low this year, and every time another shipload of paper-wrapped war supplies leaves an American port, the problem gets tougher • The voluntary cuts, the simple economies you have put into operation up to now, won't be half enough in 1944 • The only answer is honest, convincing *paper-pinching* by every one who uses paper • Organize a Paper Conservation Committee in your company. Pick only the best men for this job, and give them a green light so that they can work effectively • From envelopes to heavy cartons, have this Committee see to it that functional packaging is the order of the day—every day • In the panel are suggested many ways your plant can use less paper. But you know your own business best! Go to it *NOW!*

Use Less Paper Because

Multiwall paper bags are used extensively in shipping flour and dehydrated foods.

All openings and exposed surfaces of tanks are sealed with paper for shipping.

Submachine guns are not only paper-wrapped but boxed in paper board. Shell grommets, bomb rings and practice bomb fins are made of paper to save needed steel.

Gas-mask canisters and hand-grenade containers are made of paper.

Paper is used in camouflage strips and netting and parachutes.

All Army clothing and equipment are shipped in waterproof paper wrappers.

Use Less Paper These Ways

Condense letters and memoranda by (a) keeping margins as narrow as possible; (b) sticking to single-space forms; (c) using reverse side of incoming letters as first carbon copy of replies; (d) using reverse side of second sheets for carbon copies; (e) using both sides of all mimeographed sheets.

Check carefully to determine whether your shipping container exceeds the requirements of Rule 41 of "consolidated freight classification requirements."

Eliminate individual cartons in every practical instance.

When individual cartons are indispensable, pack in bulk whenever possible.

Control disbursement of paper supplies to employees so that excessive quantities do not accumulate in desks and departmental supply closets.

This advertisement prepared under the auspices of the War Advertising Council in co-operation with the Office of War Information and the War Production Board.

LET'S ALL USE LESS PAPER

Space for this advertisement contributed by American Perfumer and Essential Oil Review

Here and There Among Our Friends

▸ M. St. Alphonse, vice president of W. J. Bush & Co. (Canada) Ltd., Montreal, Canada, has announced the following changes in the company's organization:

A. Reddington Samuels

A. Reddington Samuels, manager of the Toronto branch since 1940, has been called to Montreal to assume the duties of general sales manager. Mr. Samuels started with W. J. Bush & Co., Ltd., in London, England, in 1915 where he obtained his laboratory experience. He came to Canada in 1931 where he was for a time in the factory and later was transferred to the New York branch, traveling extensively throughout the United States.

T. L. Smyth

G. A. Lemm

Thomas L. Smyth who succeeds Mr. Reddington Samuels as manager of the Toronto branch has been manager of the company's Winnipeg branch for the past six years. Under his direction the company's business in western Canada has shown most satisfactory progress. Gordon A. Lemm has been appointed manager of the Winnipeg branch succeeding Mr. Smyth. Mr. Lemm joined the company in 1932 and has acquired valuable experience in the various branches of the business.

▸ Frederick H. Leonhardt, president of Fritzsche Brothers, Inc., New York, N. Y., who was presented with numerous gifts by his associates at the testimonial dinner given in his honor on the occasion of his fiftieth year with the company gave as his formula "good health, hard work and a real love for my work." Those who have been most intimately associated with Mr. Leonhardt, however, realize that this simplified formula does not take in the many other personal qualities that have made his tenure of office the most progressive in the company's long history. Some of these ". . . his integrity and steadfast adherence to high principles, wise and discerning judgment, kindliness, generosity and sincere concern for the welfare of others" were inscribed upon the minutes of the organization by the Board of Directors at a special meeting and presented to Mr. Leonhardt at the dinner in suitably engrossed form.

▸ Dr. Henri Coutinho, for almost twenty years connected with various phases of the cosmetic industry in Paris and New York, and most recently associated with The George W. Luft Co., Long Island City as research director, has been elected president of the Perfumers Manufacturing Corp. Dr. Coutinho assumed his new duties May 1. His present company which has been in existence for about fifteen years, will give him an opportunity to utilize his long experience. During his years of professional activity as consultant, as well as a member of various firms, he developed many cosmetic and pharmaceutical formulas which are being used by numerous houses. Dr. Coutinho received his education at several European universities. Early in his career he began to specialize in cosmetic formulation and control; and is noted for his original research in the field of cosmetic emulsions. Some of the most important and practical contributions to cosmetic emulsions have been published by Dr. Coutinho in the trade press, and have been quoted extensively in standard reference volumes used by the cosmetic industry. He has been a member of the Scientific Advisory Committee of the Toilet Goods Assn. since its inception and is also a member of the Planning Committee of its Scientific Section.

▸ Miss Helen Martin has been appointed assistant general manager of Mary Dunhill, Inc., New York, N. Y.

▸ A. J. Wittenberg, vice-president of U. S. Industrial Chemicals, Inc., New York, N. Y., has resigned. He was director of the Stroock & Wittenberg division which became a wholly owned subsidiary of the company in 1938.

▸ Arthur Henricksen who has been associated with the essential oil and cosmetic industries for over a quarter of a century is now associated with Wallace & Tiernan, Belleville, N. J., in the pharmaceutical division. The company, incidentally, has received its third Army-Navy award. His son, Arthur, is studying engineering at Columbia University as a naval student.

▸ Herman J. Brooks, Chairman, Cosmetics Section of the 1944 Red Cross War Fund, has announced that the cosmetics industry has exceeded its quota of $75.000. At the last report donations amounted to $86.836.

▸ Roy W. Peet has been elected vice-president of Colgate-Palmolive-Peet Co., Jersey City, N. J., in charge of research and development, market research and new products.

▸ Dr. O. H. Sobell, technical director of the J. R. Watkins Co., Winona, Minn., was granted a special airplane priority to attend the recent meeting of the advisory committee of the War Production Board for household and industrial insecticides and disinfectants of which he is a member. He has also recently been appointed a member of the committee on soaps and detergents of the American Society for Testing Materials.

▸ R. Righton Webb, treasurer and general manager of W. J. Bush & Co., Inc., New York, N. Y., has returned from a well earned vacation at Daytona Beach, Fla.

▸ Peter P. Isaza, who was formerly with the Pepsodent Company, has been appointed to the position of Director of Foreign Sales for Pond's Extract Company. He has full charge of advertising and sales in the western hemisphere, excluding Canada and U. S.

▸ Eric N. Blackstead has been appointed advertising and sales manager for the Ansbacher-Siegle Corporation.

Eric N. Blackstead

His business career was started with the Spencer Lucas Company, where at nineteen he became chief chemist. He has been, in succession, chief chemist of inorganic colors, and resident representative, before returning to the main office at Staten Island, in his present capacity.

He was educated at Drexel Institute of Technology and the Brooklyn Polytechnic Institute.

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▸ Waldemar Vernet has been elected vice-president of Affiliated Products, Inc., subsidiary of American Home Products Corporation. He was associated with Mystic Laboratories when that company was acquired by Affiliated Products.

Waldemar Vernet

Prior to his entry into the cosmetics industry, he was connected with the United States Steel Company, in their Clairton, Pa., benzol plant.

▸ J. A. Veazey, assistant manager of Merck & Co., in the St. Louis office was tendered a farewell dinner by his fellow members of the St. Louis Drug Chemical and Allied Trades Assn. of St. Louis on leaving for Los Angeles to manage the company's newly established branch in that city. The turkey dinner was served at the Missouri Athletic Club and was featured by numerous toasts and libations. The two speeches which were made by Leon Broyer who recounted Mr. Veazey's virtues and past history and Frank Flynn of the American Drug Corp. who presented the guest of honor with a dozen monogrammed silver high golf balls.

▸ Dr. Willard Henry Dow received the Gold Medal Award of the American Institute of Chemists for the year 1944 at the annual meeting of the Institute in the Biltmore Hotel, New York City, on May 13. He thus joins a distinguished company of former medalists, including Andrew W. Mellon, James Bryant Conant, Marston Taylor Bogert and Frederick G. Cottrell.

W. H. Dow

Dr. Dow was born at Midland, Mich., January 4, 1897. He was graduated from the University of Michigan in 1919 as a Bachelor of Science, and went to work for the Dow Chemical Company in the same year. In 1922 he became a director and general manager. In 1930 he became president.

Dr. Dow is a member of the Advisory Board of Chicago Procurement District, Chemical Warfare Service, a director of the American Chemical Society, and a member of the American Institute of Chemical Engineers.

▸ Irving Bennett of Syntomatic Corp., New York, N. Y., is back at his desk following a month's confinement in the Post Graduate hospital as a result of a fall outside his offices late in March in which he cracked a knee cap. Following the operation he recovered rapidly and is now none the worse for the unfortunate accident.

▸ Andre Wick, President, presents Joseph Alexander with a $1,000 War Bond, while the members of the Quarter Century Club look on. Mr. Alexander, has just completed fifty years of service with Houbigant. Others shown in the picture have all been with the company for more than twenty-five years. They each received a diamond studded wrist watch. They are: Frank Lupman—25 years; Helen S'Kahill—30 years; Pearl Christ — 28 years; Louise Couillou—28 years; Mae Anderson—26 years; and Helen Kennedy—25 years. Three others, Esther Browning—28 years; Lucy Parker—25 years; and Julia Smith—28 years, were not present when the photo was made. They represent two hundred and ninety-three years service with Houbigant.

Trade Jottings for the Month

Naval stores production in Honduras

A new source of naval stores for peace time may be developing in Honduras. Honduran pine in the La Ceiba district is being extracted of resin and turpentine in a small still, which was constructed of scrap material. Pine reserves are extensive.

Trade mark protection

At a recent meeting of the Advisory Committee for the Protection of Trade Mark Rights went on record as favoring an enlarged program for 1944, and appropriated additional funds for the prosecution of violators. The Trade Mark Manufacturers are determined that their goodwill will not be jeopardized. The association counts as members Fitch, Herpicide, Jeris, Kreml, Pinaud, Vitalis and Wildroot.

Helena Rubinstein upheld

The highest tribunal in New Jersey has upheld a decision in favor of Helena Rubinstein, Inc., in a charge that Charline's Cut Rate, Inc., of Summit, New Jersey, was selling the Rubinstein cosmetics at less than fair trade prices.

The New Jersey Court of Errors and Appeals has joined the Appellate Court of New York in telling cut-rate retailers that they cannot use the OPA price ceilings as a cloak for violations of the State Fair Trade Acts.

The clown frequently gets a larger salary than the lion-tamer.

Showboat

The Sydney Ross Company, a subsidiary of Sterling Drug Inc., has started a showboat service to promote its products in the Republic of Colombia. When the launch ties up at docks natives crowd on board. Many of them have never seen a talkie before.

The showboat features movies, advertising and messages of hemisphere solidarity. The showboat visits villages along the Magdalena, Cuaca and other rivers.

EDMUND R. COMMONS has been appointed as a Sales Representative for Shulton, Inc. His territory will be Brooklyn and Long Island.

GERLAIN, INC., Perfumers of 444 Madison Avenue, New York City, has enrolled its entire staff in a group health cooperative organization. All doctors' bills to employees will be paid by the company.

THE CHEMICAL CENTER CORPORATION, 826 Broadway, which manufactures Lynette Perfumes, has also insured its entire personel in the same way.

PRIMROSE HOUSE has discontinued the manufacture and distribution of Delv Cream.

The milk of human kindness is chock full of vitamins.—*Howard S. Neiman.*

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NEWS and EVENTS

Cut rate dealers must get OPA permission to raise prices

Any concern which sold below fair trade prices in March, 1942, is enjoined from further dealing in the article until it has received permission from the OPA to raise its prices to the fair trade level according to a decision of the New Jersey Court of Errors and Appeals in the case of Helena Rubinstein Inc. v Charline's Cut Rate Inc. A concern which had been selling under the fair trade price is not automatically permitted to raise its price to that of fair trade.

Cosmetic credit men plan for Summer party June 30

The annual Summer party of the Drug, Cosmetic and Chemical Credit Men's Assn. will be held Friday, June 30, at the Soundview Golf Club, Great Neck, N. Y. According to plans announced for the affair luncheon will be served at the golf club after which a golf tournament will take place, while the women who attend may either attend the movies or play bridge. Dinner will follow at the golf club after which the party will leave for the home of Nat Otte, the popular secretary, at Great Neck Estates where an informal entertainment will be provided.

American Home Products Co. and Norwich not to merge

The proposed merger of the Norwich Pharmacal Co. and the American Home Products Corp., Jersey City, N. J., has been abandoned.

Florasynth Laboratories in larger quarters

Florasynth Laboratories, Inc., announces its removal to a four-story building at 600 West Monroe Street, Chicago, Ill.

The new plant will be under the supervision of Dr. William Lakritz, Florasynth's vice-president, and DeVere L. McNinch and Tom Flanagan.

The move, the fourth in a series toward more space, was necessitated by the Company's steadily expanding operations in the Chicago area.

Netherlands Indies Trade Commissioner moves

The Trade Commissioner for the Netherlands Indies has moved from 30 Rockefeller Plaza to Room 1417, 10 Rockefeller Plaza, New York, N. Y.

Convention meetings this month

The Toilet Goods Association is meeting for its annual convention at the Waldorf-Astoria Hotel on May 18 and 19.

The Proprietary Association is holding its annual convention at the Biltmore Hotel on May 15, 16 and 17.

Huge postwar construction program for retail drug stores outlined

A postwar construction program involving the rebuilding and modernization of the 55,000 retail drug stores in the United States and the wholesale plants that supply them was outlined by Lace I. Fitschen, president of the National Wholesale Druggists' Assn. at the recent Wartime Operations Conference in Chicago.

Florasynth Laboratories

Mexican Vanilla Beans appear on the market

Fair quantities of cut Mexican vanilla beans have eased costs to around $8.00 to $8.50 per pound. Whole beans when they reach the market will improve the picture still more.

American Society of European Chemists and Pharmacists meets

At the general meeting of the American Society of European Chemists and Pharmacists, Dr. Henry Goldschmidt was re-elected as president, Dr. Benno Baecker became secretary again, and Dr. S. Herman, former professor at the University of Prague, was elected vice-president, and Mr. C. Simson treasurer.

In the general discussion following the elections, the Assembly pledged further allegiance to the Society's fundamental aims, which consist of uniting the Chemists, Pharmacists, Pharmacologists and Physicians graduated in Europe, and achieving permanent contact and full scientific collaboration between this group, including the European scientists living in exile in the Allied countries, and American Industry and Science. A continuous exchange of ideas and experiences, and intense work on the problems of postwar planning, were accepted as the Society's program for the year 1944.

Disposal of excess supplies by Army explained

Major Joseph G. Noh, addressing the National Wholesale Druggists' Association, in Chicago, outlined the means by which the Army disposes of supplies of drugs and chemicals which are found to be in excess of requirements.

When this condition arises, which he states is quite rare, the other branches of the Army are given the opportunity of taking over the excess merchandise. Subsequent to this, it is offered to the other branches of the service, such as

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the Navy, Coast Guard, and the Marines, and finally to such agencies as Veterans Administration, Maritime Commission, Public Health Service, etc.

As a final step, before offering the merchandise to the public, the matter is referred to the industry committee under WPB, so as not to seriously dislocate civilian production and prices.

Couturiers Perfumes suspends

Couturiers Perfumes, Inc., of 9 University Place, New York, N. Y., has suspended operation for the duration of the war.

New Task Group member

Dr. Ralph L. Evans has become a member of the Task Group established under the WPB Cosmetics and Toiletries Industry Advisory Committee. Dr. Evans is president of Evans Chemetics, Inc., 250 East 43rd Street, New York, N. Y.

Howard Inches Products stipulated

Howard Inches Products, Inc., also trading as Inches Laboratories, selling a cosmetic known as "Inches Nite Caps," has stipulated with the Federal Trade Commission to cease representing the preparation as having any value in the treatment of acne or other skin ailments; that it cleanses the pores, does not make the skin greasy, enhances the complexion, is not a cosmetic, or that it contains nutritional factors.

Fitch company takes excise tax case to U. S. Supreme Court

The F. W. Fitch Co., Des Moines, Iowa, has appealed to the U. S. Supreme Court a decision by the ninth Circuit Court of Appeals that the company cannot deduct advertising or selling expenses in figuring excise taxes on toilet articles. The trial court had held that such expenses could be deducted in figuring excise taxes.

Board of Trade now in new quarters

Offices of the New York Board of Trade Inc. and all of its sections were moved to new quarters at 291 Broadway, New York 7, N. Y., May 1. The new telephone number is Barclay 7-9494.

Toilet Goods Manufacturers Association of Canada meets

The most recent gathering of the Toilet Goods Manufacturers Association of Canada was held in Montreal the 24th of April.

The principal speaker was Douglas Warkington, manager of new products, Organic Chemical Department of Canadian Industries, Limited. He spoke on the subject "New Products."

BIMS of Boston announce golf tournament dates

M. J. Pete Niles, chairman of BIMS of Boston, announces that the local organization is scheduled to play golf tournaments at Woodland Golf Club, June 22, at Commonwealth Country Club, July 27, and at Charles River Country Club, Sept. 21.

National Wholesale Druggists revise map

The National Wholesale Druggists Association, meeting in Chicago, voted funds to revise the association's nationwide distribution map. The map was originated in 1935.

Chicago Drug and Chemical Association's annual spring party

The Chicago Drug and Chemical Association's Annual Spring Party for members and their ladies will be held in the Grand Ballroom of the Drake Hotel, Chicago, Ill., on Saturday evening, May 20, at 6 p. m.

Oil of cedar leaves and oil of fruits placed under ceiling

Maximum Price Regulation No. 472 has been amended to include oil of cedar leaves and oil of fruits.

New castor oil plant building in Brazil

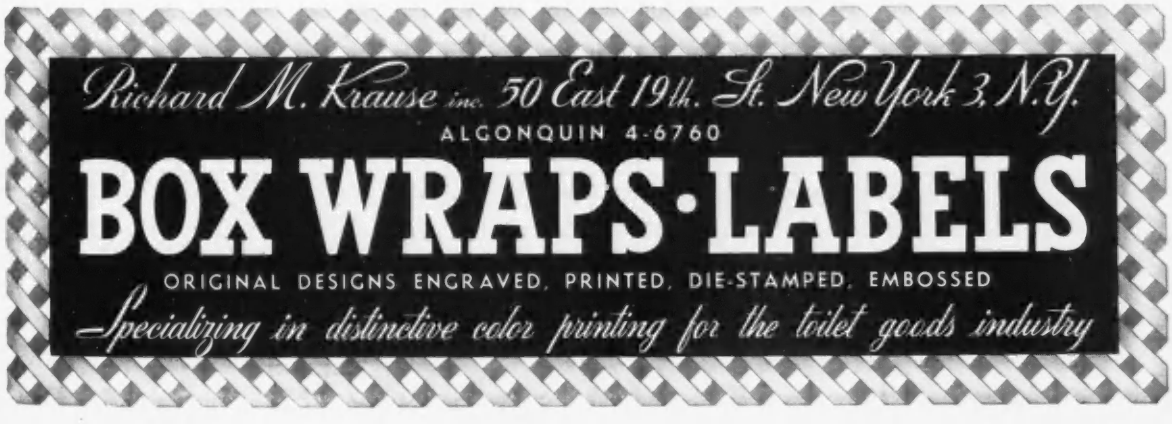
A new castor oil dehydrating plant with a capacity of about 750,000 pounds per year is to be established in Brazil, by Brazilian interests, to operate under a Brazilian process comprising heating the oil in an atmosphere of inert gas, in the presence of a catalyst.

Closing of army post exchanges will not disrupt business

The Army post exchange system "can be folded suddenly without dislocating the retail market," *Post Exchange*, New York, will point out in a 36-page booklet, "Merchandising for Morale," which will be issued soon to PX's throughout the world.

War Production Board shelves plan for increasing alcohol output

The plan of the Chemical Division of the War Production Board for further expansion of Industrial Alcohol through construction at the Williamette Valley Wood Chemicals Corporation, Springfield, Oregon, and the United States Shipping Corporation, Clewison, Florida, has been discarded.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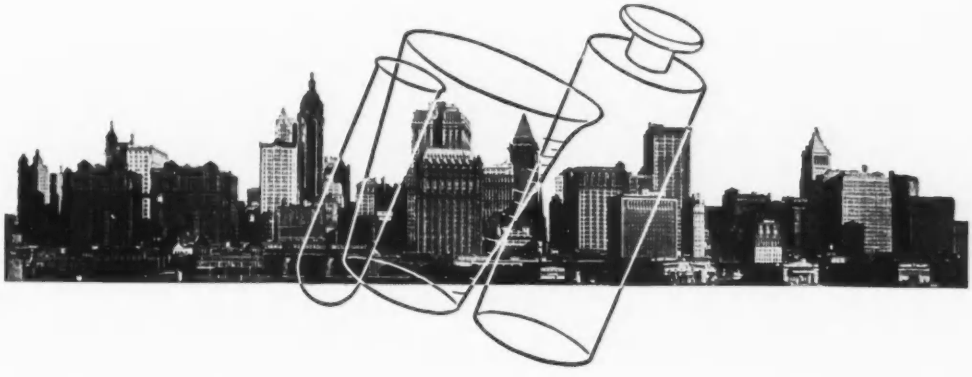

Essential Oils, Aromatics Shortages

CONSIDERABLE DIFFICULTY was encountered among major suppliers of essential oils and aromatic chemicals in filling orders because of shortage. Markets generally proved unusually interesting, however, on promises of relief in the tight position of some items; announcement of further government regulations; and several other developments.

Virtually all of the 480,000 pounds of bois de rose oil that arrived here early in March has been converted into derivatives, but it is understood that another shipment will reach this market from Brazil within the next thirty days. The new arrival will be about half the size of the quantity received here in March. Because of the value of the oil the shipment will represent a fairly sizable investment.

By amendment 2 to the Maximum Price Regulation Order 472, the Office of Price Administration established a ceiling price of $2.25 per pound for producers' sales of oil cedarleaf or oil of spruce, and dealers' ceilings ranging from $2.65 to $3.34 per pound depending upon the quantity packaged in a single container. Both oils are used as odorants in pharmaceuticals and soaps. They are produced in northern New York and Vermont. In its price announcement, OPA estimated annual sales of cedarleaf at 75,000 pounds and 50,000 pounds of spruce. Previously producers' sales of the oils were exempt from price control, while dealers' sales were frozen under General Maximum Price Regulation at prices ranging from $1.37 to $1.75. The amendment fails to make any provision for passing the increase in prices beyond the dealer.

SHIPMENT EXPECTED

According to the Foreign Economic Administration, various articles produced in Sicily and Italy are about to reach the United States. The shipment would include oils lemon, orange, and bergamot which are all badly needed for domestic consumption. Any arrivals of lemon would certainly be welcomed in view of the exceedingly tight situation existing in the California product. Many consumers unable to obtain sufficient quantities of peppermint, lemon, or certain other flavors have been turning to orange oil with the result that the latter oil has also shown a decided strengthening. One of the reasons given for the exceedingly firm conditions in California citrus oils is that government demands for fruit juices have fallen off, and less peel will be available for processing this year. Brazilian orange which was held responsible for creating considerable competition in this market a year ago, is now in demand. It is understood fairly sizable quantities have been purchased for forward delivery.

Regarding products from India, oil lemongrass displayed considerable strength. Comparatively few arrivals have been noted in recent weeks with the result spot prices have been steadily advancing because of depleted stocks. The Japanese thrust toward India is believed to have had a decided influence upon boat movements in that area.

From Madagascar, where it is generally accepted fair quantities of oils have acutally been shipped from the island along with vanilla beans, there have been no unusual developments. At first it was believed the goods would be shipped direct to the United States but latest advices indicate the cargo was forwarded to another port for transshipment. A steamer that was to carry the goods over the balance of the trip was diverted to another run and it is now indicated that the cargo will not reach the United States until some time in July.

While the aromatic chemical industry has developed many substitutes for scarce oils, it has been necessary to obtain raw materials to continue their manufacture. Some of these raw materials are being diverted to other channels in connection with the manufacture of military supplies. As a result, substitutes are also becoming exceedingly difficult to obtain. War demands for several major coal tar products including benzol and toluol continue to have a serious affect upon aromatic chemicals.

Movement of glycerine is reported in satisfactory volume. Reports from authoritative sources indicate supplies are more sufficient for all purposes. While the rise in flood waters in the Mississippi river basin back in 1937 severely

MAISON G. deNAVARRE'S new book, "Production, Control and Analysis of Cosmetics," of which this issue contains the third installment, starting on page 103, meets a long felt need in the cosmetic field. The author has assembled a plentitude of data from many sources, as well as information evolved in his own laboratory and consulting practice in this new book. We feel that this book will emerge as a standard reference.

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The rates for advertisements in this section are as follows: Business Opportunities, $1.00 per line per insertion. Situations Wanted and Help Wanted, 50c per line per insertion. Please send check with copy. Address all communications to THE AMERICAN PERFUMER, 9 East 38th St., New York.

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WELL KNOWN ENGLISH PERFUMER wishes to appoint a U.S. agent to handle post war sales. Manufactures include Perfumes, Toilet Waters, Lipstick, Face Powder and Soap, but initial introduction to U.S. market will probably be for Perfume and Toilet Waters only. Prices are high and lines are not at present known in U.S., although sales in England and other countries are large. Agent must have connection with, and employ salesman calling on, the best class of department store throughout U.S. and should be prepared to purchase goods on credit terms, to handle stock and to despatch and bill them to his customers. Generous advertising and sampling costs will be borne by the manufacturer. Write complete details of qualifications, organization and products handled to Box 2468, The American Perfumer and Essential Oil Review.

NAILING MACHINE WANTED: We want used Morgan or Doig wood box Nailing Machines at once. State make, size, best cash price. Chas. N. Braun Machinery Co., Fort Wayne, Indiana.

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PRODUCTION MAN—For large pharmaceutical house with branch factories in Latin-America. Need not be technical graduate. Must be willing to accept assignment abroad. Splendid opportunity for right man. Write full details—past experience, training, age and draft status, salary expected. Certificate of availability necessary. Write Box 2481, The American Perfumer and Essential Oil Review.

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4—Monel Open Tanks, 25 gal.
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We buy and sell from a Single Item to a Complete Plant
CONSOLIDATED PRODUCTS CO., INC.
14-15 Park Row, New York, N. Y., Shops: 335 Doremus Ave., Newark, N. J.

hit soap manufacturing plants thus adversely affecting glycerine production, the flood condition this year, is not likely to affect soap plants in that area. Some trade factors are of the opinion that the flood waters may prove beneficial in some respects since they are likely to stimulate the use of soaps in the affected areas.

Order 13 under section 21 of Maximum Import Price Regulation, substantially reduces prices paid to foreign sellers for imported natural menthol. The new ceilings as announced by OPA became effective April 17 and apply to four levels of distribution, namely, the importers' maximum buying price at $15 per pound, duty paid, f.o.b., any U. S. port of entry; the importers' maximum selling prices per pound to industrial users or to repackagers, in original containers, f.o.b., any U. S. port of entry, duty paid of $16.50 for 500 pound lots or over, $16.75 for 100-500 pounds, and $16.90 for 10-100 pound lots; ceilings for sales by repackagers to wholesalers and industrial users, ranging from $20.92 to $22.10 per pound; and ceilings on sales by wholesalers to industrial users and retail druggists at from $1.80 an ounce to $27.13 per pound, the latter applying to single pound repackaged containers.

Since Brazilian manufacturers had been receiving as much as $35 to $40 per kilo for their menthol, the announcement of ceilings, according to reports from some houses, resulted in an immediate withdrawal of all offerings from Brazil. Future trade was for a time virtually at a standstill. One house who imports the goods and repacks it for the retail trade, thus receiving the benefit of the wide spread between import prices and the maximum levels at which repackaged goods may be sold, stated that a reasonable amount of forward business has been placed at the new ceilings.

The maximum buying price of $15 per pound is said to be equivalent to about $30.50 per kilo, a long way from the prices of $35 to $40 which Brazilian manufacturers had been selling goods. Many regard the lower maximum buying price as unusual in the face of pressing demands for menthol in this market. Certainly low prices, it is held, cannot be expected to encourage production in the primary center.

An essential oils industry advisory committee, headed by A. L. Kalish, of the Office of Distribution, WFA, has been organized by the War Food Administration. The committee is composed of representatives from the essential oils industry. The committee's first meeting is tentatively scheduled to be held in Washington, D. C.

Technical information about propylene glycol N.F. used as a flavoring vehicle and in cosmetic and pharmaceutical manufacturing is contained in a booklet which may be had for the asking from the manufacturer, The Dow Chemical Co., Midland, Mich.

A regulation which prevented the reproduction of pictures of heroes of World War II in advertising has been modified by the Navy to permit the use of the illustrative material with consent of the individual and of the Navy's Office of Public Relations.

There are now twenty-five factories making soap and perfume in Venezuela. A substantial business is being done in manufacturing inexpensive soap for bathroom and tub.

BRIDGEPORT...

For the past two years our facilities have been devoted almost exclusively to the production of war materials. We have been fortunate, in that we have been able to handle this work on the same equipment used for our regular peace time products, and, consequently, when material again becomes available for lipstick containers, vanity cases and other metal cosmetic items we will be prepared to start producing our regular line immediately. If you too are planning your post war program, we will be glad to assist you.

THE BRIDGEPORT METAL GOODS MFG. CO.

Established 1909

BRIDGEPORT 'PHONE BRIDGEPORT 3-1313 CONNECTICUT

VANITY CASES • ROUGE CASES • PASTE ROUGE CONTAINERS • LIPSTICK HOLDERS (ALL TYPES) • POWDER BOX COVERS • EYEBROW PENCIL HOLDERS • BOTTLE CAPS • JAR CAPS • METAL NOVELTIES TO ORDER

Obituary

Augustin Blanqué

Augustin Blanqué, president of Bruno Court, Grasse, France, died December 14, 1943, at the age of 54 years, according to news which has just been received in this country. Mr. Blanqué was identified with the company for many years as a partner; and over the years has been a frequent visitor to the United States where he won many friends throughout the industry. Mr. Blanqué was the son-in-law of Mme. Vve Antoine Merle, former proprietor of the business. He is survived by his widow and two daughters. Mr. Blanqué was a Captain in the French Air Force during this war and received the Legion of Honor and the Croix de Guerre. Two years ago he had a stroke, and while no definite information has been received it is believed that this may have been a factor in causing his early death.

Augustin Blanqué

Mr. Blanqué belonged to the younger generation of essential oil manufacturers who won a place for themselves in the business world during the 20's, and naturally as the business expanded he became a partner in and finally the head of the house which did a world-wide business. Bruno Court is represented in this country by Naugatuck Aromatics, New York, N. Y.

Oswald N. Cammann

Oswald N. Cammann, former president of the Chesebrough Manufacturing Company, died in New Canaan, Conn., April 20. He is survived by a daughter and a son.

Thomas G. Ward

Thomas G. Ward, representative for Dodge & Olcott Company, died suddenly in his sixty-fourth year at his home in Westfield, New Jersey, on April 21st.

Mr. Ward entered the services of Dodge & Olcott in 1898 where he spent his entire business career. He started as a salesman during the first World War and was very active until a few days before his death.

He is survived by his widow, Ruth B. Ward, his daughter, Ruth C. Ward, a brother, William P. Ward, and a sister, Margaret B. Ward, all of Westfield, New Jersey.

It is reported that peanut-oil manufacturers in Peru intend to more than double the area planted to peanuts in 1943, and indications are that small growers also will increase their peanut acreage.

Although no exact figures are available on the area that is normally planted to peanuts in Peru, it is estimated that the total does not exceed 500 acres. Estimated yield of peanuts in hulls is from 1,500 to 3,000 pounds per acre.

Importations of peanuts into Peru have practically ceased since the beginning of the war. During the period from 1937 to 1940 more than 138 short tons of unhulled peanuts were imported annually, principally from Hong Kong, China, and Japan.

It is estimated that from 618 to 1,236 acres of land planted to peanuts are needed to replace normal imports in the form of unhulled peanuts and peanut oil that have been reduced since the beginning of the war.

René Forster Company

Fine Aromatic Chemicals

Essential Oils Specialties

404 Fourth Ave. New York 16, N.Y.

Murray Hill 5-0250

PRICES IN THE NEW YORK MARKET

(Quotations on these pages are those made by local dealers, but are subject to revision without notice)

ESSENTIAL OILS

Almond Bit, per lb.	3.50@	4.00
S. P. A.	4.75@	5.10
Sweet True	1.65@	1.90
Apricot Kernel	.56	Nom'l
Amber, rectified	2.25	Nom'l
Angelica Root	125.00@	150.00
Anise, U. S. P.	3.85	Nom'l
Imitation	1.75@	2.10
Aspic (spike) Span.	3.80@	4.10
Avocado	.90@	.95
Bay	1.45@	1.70
Bergamot	25.00	Nom'l
Brazilian	10.00@	10.25
Artificial	4.00@	9.25
Birch, sweet	3.35@	5.25
Birchtar, crude	2.25	Nom'l
Birchtar, rectified	4.25	Nom'l
Bois de Rose	4.50@	5.00
Cade, N. S. P.	1.10@	1.35
Cajeput	2.25@	3.00
Calamus	22.50@	35.00
Camphor, "white," dom.	.35@	.45
Cananga, native	10.75@	12.50
Rectified	15.00@	19.00
Caraway	17.50	Nom'l
Cardamon	28.00@	32.00
Cassia, rectified, U. S. P.	12.00	Nom'l
Imitation	3.75@	
Cedar leaf	1.35@	1.60
U. S. P.	2.65@	3.34
Cedar wood	.85@	.95
Celery	24.00@	26.00
Chamomile	150.00	Nom'l
Cinnamon	15.00@	32.00
Citronella, Ceylon	1.05@	1.25
Java	3.25	Nom'l
Cloves, Zanzibar	1.50@	1.75
Copaiba	.85	Nom'l
Coriander	30.00@	32.00
Imitation	12.00@	14.00
Croton	3.75@	4.00
Cubebs	5.25	Nom'l
Cumin	8.25@	10.00
Dillseed	7.50	Nom'l
Erigeron	2.15@	2.50
Eucalyptus	1.55	Nom'l
Fennel, Sweet	4.00	Nom'l
Geranium, Rose, Algerian	13.00@	15.00
Bourbon	16.00@	18.00
Turkish	5.25@	6.00
Ginger	21.00@	22.00
Guaiac (Wood)	4.50@	6.10
Hemlock	1.50	Nom'l
Substitute	.55@	.60
Juniper Berries	15.00	Nom'l
Juniper Wood, imitation	.75@	.80
Laurel	5.00	Nom'l
Lavandin	8.25	Nom'l
Lavender, French	10.00@	12.00
Lemon, Calif.	3.25	Nom'l
Lemongrass	1.60@	1.75
Limes, distilled	7.00@	7.75
Expressed	11.00@	11.75
Linaloe	3.65@	4.00
Lovage	95.00	Nom'l
Marjoram	7.25@	7.50
Neroli, Bigarde P.	300.00@	375.00
Petale, extra	275.00@	340.00
Olibanum	5.00@	5.75
Opopanax	25.00@	38.00
Orange, bitter	4.00@	4.50
Brazilian	1.25@	1.50
Calif., exp.	1.50@	
Orris Root, abs. (oz.)	135.00@	
Artificial	36.00@	40.00
Pennyroyal, Amer.	3.25@	4.10
European	3.15@	4.10
Peppermint, natural	7.50@	
Redistilled	8.05@	
Petitgrain	1.70@	2.00
Pimento	5.25@	8.00
Pinus Sylvestris	4.25@	5.00
Pumillonis	4.25	Nom'l
Rose, Bulgaria (oz.)	25.00@	32.00
Synthetic, lb.	45.00@	55.00
Rosemary, Spanish	2.00@	2.10
Sage	6.25@	7.50
Sage, Clary	30.00@	35.00
Sandalwood, East India	6.75	Nom'l
Sassafras, natural	2.00@	2.35
Artificial	1.25@	1.80
Snake root	10.00@	12.75
Spearmint	4.00	Nom'l
Thyme, red	2.60@	3.25
White	3.25@	5.00
Valerian	40.00	Nom'l
Vetivert, Java	45.00	Nom'l

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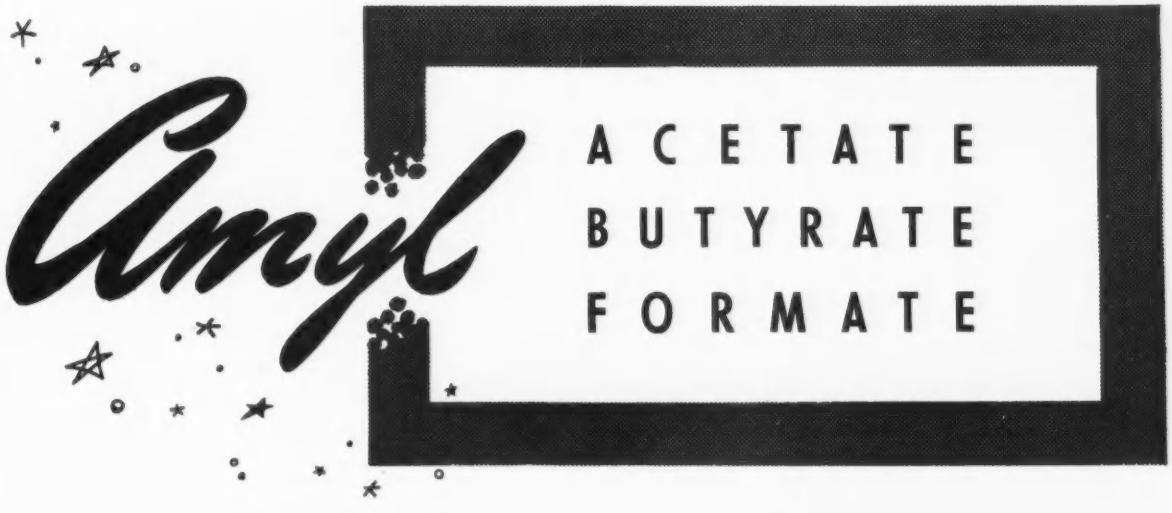

THREE NORTHWESTERN FLAVORING ESTERS WHICH ARE STILL AVAILABLE IN MODERATE QUANTITIES

THE LARGEST MAKERS OF BUTYRIC ETHER IN THE WORLD

THE NORTHWESTERN CHEMICAL CO.
INCORPORATED 1882 WAUWATOSA, WISCONSIN

(Continued from page 97)

Wintergreen	5.25@ 8.50
Wormseed	5.25 Nom'l
Ylang Ylang, Manila	38.00 Nom'l
Bourbon type	18.00@ 20.00

TERPENELESS OILS

Bay	2.75@ 3.00
Bergamot	49.00 Nom'l
Grapefruit	65.00@
Lavender	28.00 Nom'l
Lemon	40.00@ 55.00
Lime, ex.	80.00@100.00
Distilled	60.00@ 67.00
Orange sweet	57.00@100.00
Peppermint	13.00@ 13.25
Petitgrain	3.75@ 4.00
Spearmint	5.00@ 6.00

DERIVATIVES AND CHEMICALS

Acetaldehyde 50%	1.90@ 2.75
Acetophenone	1.60@ 1.75
Alcohol C 8	7.50 Nom'l
C 9	14.00 Nom'l
C 10	7.75@ 12.00
C 11	11.50 Nom'l
C 12	7.20@ 8.50
Aldehyde C 8	22.50@ 28.00
C 9	32.00 Nom'l
C 10	22.00@ 29.00
C 11	22.00 Nom'l
C 12	25.00@ 30.00
C 14 (so called)	9.25@ 9.75
C 16 (so called)	7.65@ 8.25
Amyl Acetate	.50@ .75
Amyl Butyrate	.90@ 1.10
Amyl Cinnamate	4.50@ 5.80
Amyl Cinnamate Aldehyde	2.75@ 5.00
Amyl Formate	1.00@ 1.75
Amyl Phenyl Acetate	3.75@ 4.00
Amyl Salicylate	.85@ 1.00
Amyl Valerate	2.00@ 2.75
Anethol	2.75@ 2.85
Anisic Aldehyde	3.15@ 4.00
Benzophenone	1.15@ 1.30
Benzyl Acetate	.65@ 1.00
Benzyl Alcohol	1.25@ 2.00
Benzyl Benzoate	1.10 Nom'l
Benzyl Butyrate	2.25@ 3.00
Benzyl Cinnamate	5.15 Nom'l
Benzyl Formate	2.50@ 3.00
Benzyl-Iso-eugenol	10.25 Nom'l
Benzylidenacetone	2.25@ 3.40
Borneol	1.80 Nom'l
Bornyl Acetate	2.00 Nom'l
Bromstyrol	5.00 Nom'l
Butyl Acetate	.11@ 14½
Cinnamic Acid	3.75@ 4.50
Cinnamic Alcohol	3.75@ 4.00
Cinnamic Aldehyde	1.75 Nom'l
Cinnamyl Acetate	10.40@ 12.00
Cinnamyl Butyrate	12.00@ 14.00
Cinnamyl Formate	10.00@ 13.00
Citral, C. P.	3.85@ 4.25
Citronellol	6.50@ 7.00
Citronellyl Acetate	8.60@ 9.20
Coumarin	3.00@ 3.50
Cuminic Aldehyde	8.00@ 11.25
Diethylphthalate	.24 Nom'l
Dimethyl Anthranilate	4.55@ 5.00
Ethyl Acetate	.25 Nom'l
Ethyl Anthranilate	5.75@ 7.50
Ethyl Benzoate	.90@ 1.15
Ethyl Butyrate	.75@ .90
Ethyl Cinnamate	3.25@ 3.75
Ethyl Formate	.60@ 1.00
Ethyl Propionate	.80 Nom'l
Ethyl Salicylate	.90@ 1.00
Ethyl Vanillin	5.25@ 6.00
Eucalyptol	2.75 Nom'l
Eugenol	2.90@ 3.25
Geraniol, dom.	3.50@ 4.75
Geranyl Acetate	4.00 Nom'l
Geranyl Butyrate	8.20@ 8.50
Geranyl Formate	9.25@ 10.00
Heliotropin, dom.	3.75@ 6.00
Hydrotopic Aldehyde	15.00@ 18.00
Hydroxycitronellal	7.75@ 10.00
Indol, C. P.	23.00@ 26.50
Iso-borneol	1.00@ 1.10
Iso-butyl Acetate	1.25@ 2.00
Iso-butyl Benzoate	1.50@ 2.60
Iso-butyl Salicylate	2.70@ 3.00
Iso-eugenol	4.00@ 4.85
Iso-safrol	3.00 Nom'l
Linalool	7.50@ 8.00
Linalyl Acetate 90%	7.00@ 8.75
Linalyl Anthranilate	15.00@
Linalyl Benzoate	10.50@
Linalyl Formate	9.00@ 12.00
Menthol, Brazilian	16.50@
Methyl Acetophenone	1.80 Nom'l
Methyl Anthranilate	2.75@ 3.00
Methyl Benzoate	.70@ 1.10
Methyl Cellulose, f.o.b. shipping point	.60 Nom'l
Methyl Cinnamate	2.25@ 3.50
Methyl Eugenol	3.50@ 6.75
Methyl Heptenone	3.25 Nom'l
Methyl Heptine Carbonate	40.00@ 60.00
Methyl Iso-eugenol	5.85@ 10.00
Methyl Octine Carbonate	24.00@ 30.00
Methyl Paracresol	2.50 Nom'l
Methyl Phenylacetate	3.75@ 4.00
Methyl Salicylate	.35@ .38
Musk Ambrette	9.50 Nom'l
Ketone	4.50@ 9.70
Xylene	1.65@ 2.50
Neroline (ethyl ether)	2.00@ 3.15
Paracresol Acetate	2.50@ 3.00
Paracresol Methyl Ether	2.60 Nom'l
Paracresol Phenyl-acetate	6.50@ 8.50
Phenylacetaldehyde 50%	3.00@ 3.35
100%	4.50@ 5.00
Phenylacetic Acid	3.00@ 3.75

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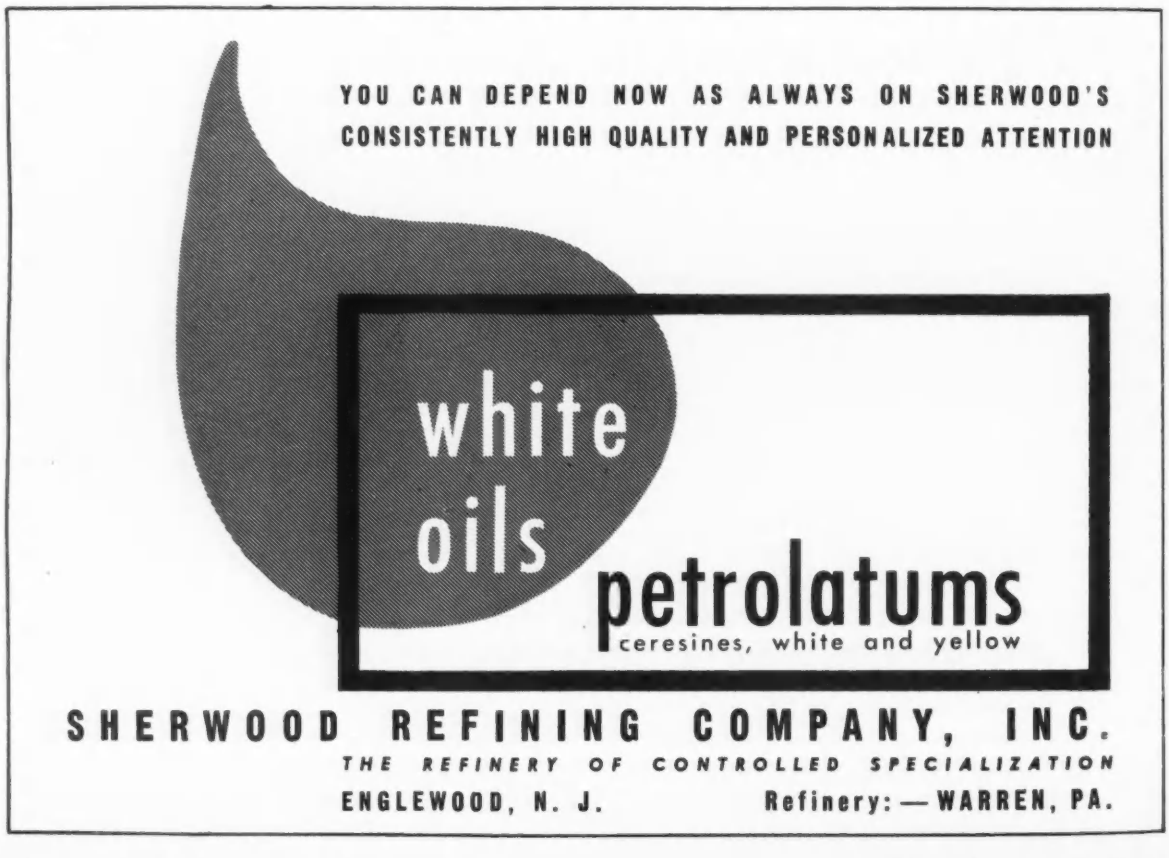

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Phenylethyl Acetate	2.50@	4.10
Phenylethyl Alcohol	2.50@	3.00
Phenylethyl Anthranilate	16.00@	
Phenylethyl Butyrate	3.75@	4.25
Phenylethyl Propionate	3.50@	4.75
Phenyl Formate	12.50@	18.00
Phenyl Valerianate	16.00@	17.50
Phenylpropyl Acetate	8.00@	10.00
Santalyl Acetate	20.00@	22.50
Scatol, C. P. (oz.)	5.35@	6.00
Styrolyl Acetate	2.50@	3.00
Styrolyl Alcohol	9.25@	12.00
Vanillin (clove oil)	2.60	Nom'l
(guaiacol)	2.35	Nom'l
Lignin	2.35	Nom'l
Vetivert Acetate	25.00	Nom'l
Violet Ketone Alpha	18.00	Nom'l
Beta	15.00	Nom'l
Methyl	6.50	Nom'l
Yara Yara (methyl ester)	2.00@	3.10

BEANS

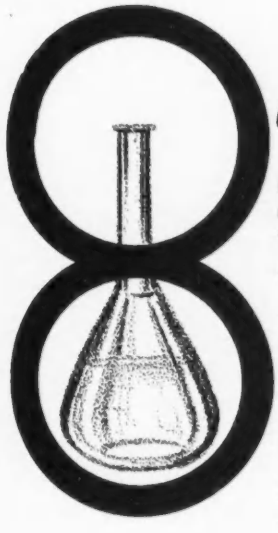
Tanka Beans, Surinam	.70@	.95
Angostura	2.40@	2.75
Vanilla Beans		
Mexican, whole	9.00@	10.00
Mexican, cut	7.75@	8.25
Bourbon	9.50@	10.50
Tahiti	3.75@	4.00

SUNDRIES AND DRUGS

Acetone	.8½@	.09
Almond meal	.25@	35
Ambergris, ounce	13.50@	18.50
Balsam, Copaiba	.52@	.54
Peru	1.05@	1.20
Beeswax, bleached, pure		
U. S. P.	.57	Nom'l
Yellow, refined	.52½	Nom'l
Bismuth, sub-nitrate	1.20@	1.22
Borax, crystals, carlot ton	55.50@	58.00
Boric Acid, U. S. P., cwt.	6.95@	7.55
Calamine	.18@	.20
Calcium, phosphate	.08@	.08¾
Phosphate, tri-basic	.09@	.10
Camphor, domestic	.69@	.84
Castoreum	13.00@	17.00
Cetyl Alcohol	1.75	Nom'l
Pure	2.25	Nom'l
Chalk, precip.	.03½@	.06½
Cherry Laurel Water, jug, gal.	3.60@	4.00
Citric Acid	.21	Nom'l
Civet, ounce	22.00@	28.00
Clay, colloidal	.07@	.15
Cocoa Butter, lump	.25½@	.27
Cyclohexanol (Hexalin)	.30@	.50
Fuller's Earth, ton	15.00@	33.00
Glycerin, C. P., drums	.18¼@	.18¾
Gum Arabic, white	.42@	.45
Amber	.13@	.14
Powdered, U.S.P.	.19@	.21
Gum Benzoin, Siam	5.00	Nom'l
Sumatra	1.35@	1.40
Gum Galbanum	1.80@	2.00
Gum Myrrh	.50@	.55
Henna, pwd.	.30@	.35
Kaolin	.05@	.07
Labdanum	3.25@	5.00
Lanolin, hydrous	.35@	.36
Anhydrous	.36@	.37
Magnesium, carbonate	.09@	.10¾
Stearate	.24@	.27
Musk, ounce	50.00	Nom'l
Olibanum, tears	.18@	.35
Siftings	.11½@	.13
Orange Flower Water, gal.	1.75@	2.25
Orris Root, African, pwd.	1.10@	1.15
Paraffin	.06¼@	.09
Peroxide	1.10@	1.75
Petrolatum, white	.06¼	.08½
Quince Seed	1.75@	2.00
Rice Starch	.10	Nom'l
Rose Leaves, red	3.50@	4.00
Rose Water, gal.	6.50@	8.00
Rosin, M. per cwt.	5.33@	
Salicylic Acid	.35@	.40
Saponin	2.00@	2.50
Silicate, 40°, drums, works, 100 pounds	.80@	1.20
Soap, neutral, white	.20@	.25
Sodium Carb. 58% light, 100 pounds	1.35@	2.35
Hydroxide, 76% solid, 100 pounds	2.60@	3.75
Spermaceti	.26@	.27
Stearate Zinc	.30@	.31
Styrax	1.40@	1.60
Tartaric Acid	.64	Nom'l
Tragacanth, No. 1	4.50@	4.85
Triethanolamine	.34½	Nom'l
Violet Flowers	1.75@	2.00
Zinc Oxide, U. S. P. bbls.	.10½	.10¾

OILS AND FATS

Castor No. 1, tanks	.13@	
Cocoanut, Manila Grade, c.i.f., tanks	.0835@	
Corn, crude, Midwest, mill, tanks	.12¾@	
Corn Oil, distilled, drums	.16¼@	.16½
Cotton, crude, Southeast, tanks	.12¾@	
Grease, white	.08⅞@	
Lard	.1380@	
Lard Oil, common, No. 1 bbls.	.14@	
Palm, Niger, drums	.0865	
Peanut, blchd., tanks	.15@	
Red Oil, distilled, tanks	.12½@	
Stearic Acid		
Triple Pressed	.18⅝@	.19⅝
Double Pressed	.15⅞@	.16⅞
Tallow, acidless, barrels	.14¼@	
Tallow, N. Y. C., extra	.08⅝@	
Whale oil, refined	.1232	Nom'l



8 *Reasons Why* **PLYMOUTH**

ZINC STEARATE U. S. P.

IS BEST FOR DRUGS AND COSMETICS

1 Backed by the longest commercial Stearate manufacturing experience in America . . M. W Parsons offer you this new product as the finest Zinc Stearate that can be made.

2 Years of research have made possible a particularly white product

3. Special production methods . . . developed over more than a quarter of a century . have made it ODORLESS

4 It will not develop offensive odors even if kept for a long period

5. It enables your face powder to retain the same odor that you give it.

6. A smooth, light, fluffy texture has been finally and definitely achieved.

7 Tested independently it shows the following results: ARSENIC (Gutzeit and Spectrographic Test) . . Not Found. LEAD (Spectrographic Determination) . . . 1.7 parts per million.

8. The reputation and record of M. W. Parsons assure you of Uniformity in all shipments.

We also manufacture a superlative grade of PLYMOUTH MAGNESIUM STEARATE

M. W. PARSONS

59 BEEKMAN STREET — *Imports* — Telephone BEEKMAN 3-3162—3163—3164

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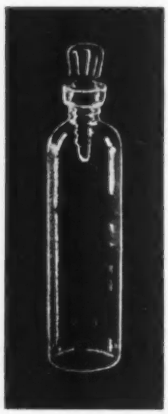

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Sales of beauty aids in 1943 totalled $594,000,000

Office of War Information figures recently released show that sales have increased 63 per cent since 1939 when Americans spent $395,000,000 for beauty aids. In 1943 it is reported sales totalled $594,000,000. Despite the trend toward higher prices the volume was done in the low priced units. Of 120,000,000 lipsticks sold in 1942 for example about 80,000,000 were in the ten-cent size and only 20,000,000 cost one dollar or more.

Coty makes broadcast offer to mayor of New York City

Grover A. Whalen, chairman of the board of Coty Inc. New York, N. Y., has offered Fiorello H. LaGuardia, mayor of New York City, $25,000 to broadcast once a week for 25 weeks over a commercial radio station. The money which Coty proposes to pay would be turned over to the City treasury if the Board of Estimate accepts the offer.

Complaint against Listerine claims set aside by Federal Trade Commission

The Federal Trade Commission has set aside the complaint against the Lambert Pharmacal Co., St. Louis, Mo., which trial examiners had pressed against the company. The action has been pending four years and involved 15 hearings, 102 witnesses and 523 exhibits.

Hearings had centered around three claims: that dandruff was caused by an infectious germ which Listerine would kill; that Listerine effectively prevents colds and sore throats and kills all mouth or throat germs; and that Listerine halts food fermentation which causes halitosis and bad breath.

The complaint was dismissed without prejudice which in effect leaves the way open to the commission for future action if it is deemed necessary.

National income of 165 billion predicted for 1946

Civilian employment in 1946 will be about ten million greater than it was in 1940 according to Amos Taylor, director of the Bureau of Foreign and Domestic Commerce. The estimated value of goods and services will level off to about 165 billion, he predicts. About two million men will be retained in the army and another two million may be unemployed. The maintenance of private buying power to step into the gap caused by falling government expenditures is necessary to achieve post war economic balance.

Drug firm purchase by stock exchange pending

A deal is pending whereby Frederick Stearns is to merge with Sterling Drug by an exchange of stock. The deal will be consummated upon the settlement of various legal questions.

Consumer cooperative survey shows 16,481 people at work

The first survey of employees of consumer cooperatives in the United States recently completed by the Cooperative League of the U. S. A., shows that 16,481 people are employed in full time positions in associations affiliated with the league and national cooperatives.

Markets for finished goods must be expanded, says Federal Reserve

Markets for finished goods must be expanded and maintained considerably above prewar levels if the United States is to utilize its new born capacity according to the Federal Reserve Board.

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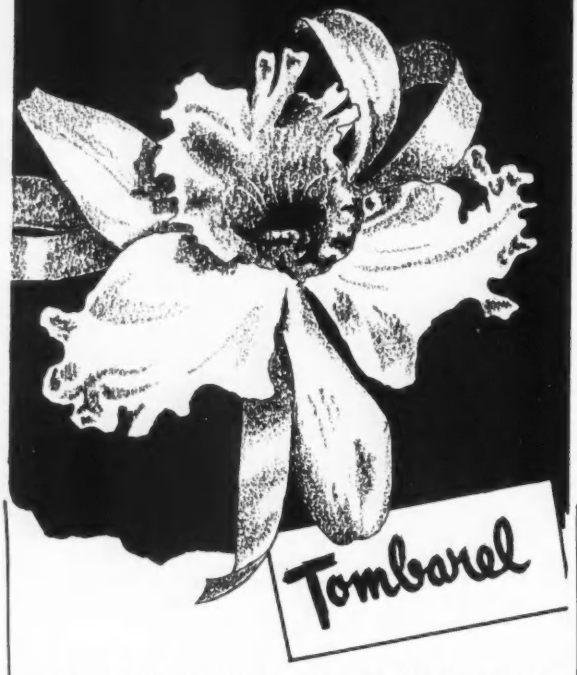

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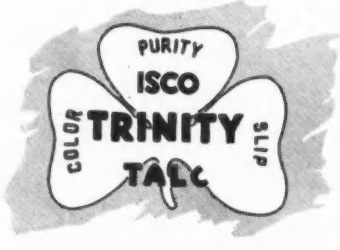

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Production Control and the Analysis of Cosmetics

by MAISON G. DENAVARRE, Ph.C., B.S.

Technical Editor of the American Perfumer & Essential Oil Review and of Elaboraciones y Envases, Special Lecturer in Cosmetics, Wayne University, College of Pharmacy, Consulting Chemist

Third Installment.

The second installment was published in the preceding issue. Subsequent installments will appear in forthcoming issues.

ACKNOWLEDGMENTS

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CHAPTER III

Basic Literature

Basic reading for anyone doing control work. Essential reference books.

(Copyright 1944 American Perfumer & Essential Oil Review)

Value of Production Control and Analysis. Necessary Reference Books and Journals

PRODUCTION CONTROL MAKES it possible for a manufacturer to supply the consumer a standard product of uniform appearance, texture, effectiveness and composition at all times, within the limits of practicality.

If a sample of hand lotion, for example, is made according to the same formula each time, it does not necessarily have the same viscosity or color. One batch of gum—if used, will give all sorts of viscosities depending on how it is treated. No two batches of gum will produce the same viscosity of mucilage. If the batch cools faster on one day than on another, its viscosity and even its stability may be affected. If one of the ingredients is left out by error, a control chemist can quickly find it out.

In the case of colored cosmetics, it is essential that the tint should at all times be as nearly the same as possible. For clear liquids the problem is easy. Even some emulsified products can be easily controlled for color. But face powder, rouge, lipstick, pancake make-up, leg stick, powder creams and similar products are more difficult to check. The author has bought boxes of the same shade of well-known advertised brands of face powder from various retailers and found as much as several hundred per cent variation in color for the same shade. *Some companies are not checking the colors or are doing a poor job of it!*

Production control minimizes the number of complaints and gives the manufacturer a better opportunity of finding their cause. It enables the salesman to be sure of his product, knowing that it is always checked for uniformity before released for sale. The consumer in turn learns that certain brands of product are always the same and can be relied upon to give the same results at all times.

ANALYSIS

The analysis of cosmetic products is a valuable tool in determining the composition of preparations made by one's own company, as well as those made by competitors. By knowing all about competitive products, a technician can in turn advise the management of any advantages or disadvantages so that the management can intelligently answer questions made by the sales department.

To say that a cosmetic can be analyzed completely and in every detail is untrue because many of the materials used are mixtures of only partially known composition, such as beeswax or lanolin. In many cases there exists no methods of analysis for these products beyond certain semi-quantitative methods. Some of the procedures outlined in later portions of this book suffer for this paucity of knowledge. Beside this, the method of separating the various ingredients requires a great deal of additional work to be done before such methods will give true reproducible results.

In mixtures, as in the case of permanent waving solutions, for example, where there is present a combination of sodium and potassium ions, along with alkalon amines together with borate, sulfite and carbonate ions, it is an extremely difficult job to establish the exact composition from analysis. This is but one case where such difficulty exists, especially since manufacturers are probably using mixtures of ions to further confuse analysis of their products.

Analysis does not tell everything about a product because it may conform with predetermined specifications and yet the product may be off physically. Thus, face powder may be of the wrong shade, of different bulking value or a depilatory may not remove hair, while a permanent waving preparation fails to produce a wave. For things such as this, it is, therefore, apparent that physical testing methods must be devised, so that they may be used in conjunction with analysis to determine the value of each batch of the product made.

BOOKS AND REFERENCES

Every laboratory needs a certain number of reference books and should be subscribing to the most important scientific and trade journals that apply to the industry. A basic list of both has been prepared which can be augmented for special cases. This list is not complete, but is intended to serve only as a guide, especially for those laboratories where there are limited funds for books and journals.

One should always keep in mind that it is possible to get either photostatic or microfilm copies of articles appearing in other journals by writing to the Library of the United States Department of Agriculture, Washington 25, D. C. A careful watching of the literature, especially of abstracts will disclose such unusual and desirable articles.

NECESSARY REFERENCE BOOKS

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Chemical Abstracts—American Chemical Society, Easton, Pennsylvania.
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Journal American Pharmaceutical Association—2215 Constitution Avenue, Washington 7, D. C.
Journal Association Official Agricultural Chemists—Box 540, Benjamin Franklin Station, Washington, D. C.
American Perfumer & Essential Oil Review—9 E. 38th Street, New York 16, N. Y.
Journal Chemical Education, Easton, Pennsylvania.
The Chemist Analyst—J. T. Baker Chemical Co., Phillipsburg, N. J.
Drug and Cosmetic Industry—101 W. 31st Street, New York 1, New York.
Merck Report—Merck & Company, Rahway, New Jersey.
Drug Trade News—330 W. 42nd Street, New York 18, New York.
The Analyst (London)—7-8 Idol Lane, London E.C.3, England.
Manufacturing Chemist—Leonard Hill, Ltd.—17 Stratford Place, London, W.1, England.
Soap, Perfumery & Cosmetics—Ludgate House, 110 Fleet Street, London, E.C.4, England.
Fette und Seifen—Berlin, Germany.
Seifensieder Zeitung—Augsburg, Germany.

CHAPTER IV

Physical and Chemical Testing Gravimetric and Volumetric Methods

Methods commonly used in testing laboratories. Chemical testing is of two types. Brief comments on each type with suggestions for overcoming errors.

Physical and Chemical Testing

PRODUCTION CONTROL AND ANALYSIS utilizes both physical and chemical methods. Physical methods are designated in this book as "P" and chemical methods as "C". It is a mote point as to when a method is physical or chemical, but to make it easier, those methods involving chemical reactions will be considered as *chemical* methods, while those involving only physical means, such as weighing, distillation or extraction will be considered as *physical* methods.

PHYSICAL METHODS

The equipment needed for production control and analysis by physical means is described in chapters I and II. Additional to this, is certain equipment with such function which will be described under each respective test, since it would have been practically impossible to list it all in the equipment chapter.

Among the *physical methods* listed hereafter will be some taken from the U. S. P. XII, the N.F. VII, the Official and Tentative Methods of Analysis of the A. O. A. C. (Association Official Agricultural Chemists), Toilet Goods Association Standards, Official Methods of the A. O. C. S. (American Oil Chemists' Society). These abbreviations will appear along side of the title of the method used and for further information about them the original should be read.

Some physical methods will be included under the actual products being tested because they seem to fit in better that way. Only methods that are referred to more than once are described in this chapter, for the purpose

of avoiding repetition and saving space and paper. All methods are arranged in alphabetical order and references to them will be made as P-5, for example, describing *Smith's Method of Determining Abrasiveness of Dentifrice Materials.*

P-1—ABRASION USING THE IMPROVED SAND ABRASER

Testing abrasion resistance by falling sand, emery, or other abrasive is probably the oldest laboratory method used for this important property. The Gardner falling sand device shown in figure 43 makes it easy to perform

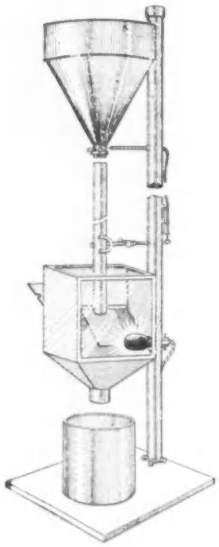


Figure 43
Gardner Sand Abraser

this test. The apparatus consists of a funnel shaped reservoir for the abrasive, with a neck having an inside diameter of ¾ inch, a support for the panel arranged at an angle of 45° from the horizontal, a shield around the support, and a receiver for the abrasive.

The guide-tube ends one inch above the panel. From the junction between the funnel proper and its neck the distance to the panel is 36 inches. For convenience, a metal gate valve has been inserted in the neck of the funnel near the top in order to start and stop the flow of abrasive. This valve is very desirable if the exact amount of abrasive is to be determined. A heavy base plate and a substantial upright support give stability.

The choice of abrasive depends upon the type of film to be tested. Ottawa sand (20-30 mesh) has been the most widely used type, but more rapidly abrading materials, such as ground quartz, Carborundum, Aloxite, or steel shot, save much time for the more resistant films.

To make a test, the device is made plumb, the panel is placed on the support below the guide tube, and a receiver is placed in position. The required amount of abrasive is poured into the reservoir, portion-wise, if necessary. The valve is opened and the abrasive allowed to fall on the finish until the latter is worn through or until the required amount has been used. Results may be expressed on either a volume or weight basis, but the latter is preferred.

Some typical results, using Ottawa sand (20-30 mesh) follow:

Material	Liters of Sand Required to Penetrate Film	
	Dried 2 days	Dried 7 days
Tung Oil Spar Varnish No. 1	13.9	28.0
Four-Hour Varnish A	7.2	9.0
Four-Hour Varnish C	8.3	8.6
Floor Varnish	13.2	11.5
Rosin Gloss Oil	0.05	0.02
Orange Shellac	1.6	4.7
Clear Nitro Lacquer A	1.6	1.2
Motor Transport Lusterless Olive-Drab Enamel with primer	(baked) 25 liters	
Cartridge Case Varnish	(baked) 5.8 liters	

It is advisable to make the tests on films of uniform thickness and at constant temperature and relative humidity.

P-2—ABRASION-FEDERAL STANDARD, FFF-D-191a-3 (JUNE 1940)

The toothpaste shall be placed on glass and rubbed with a metal instrument having a surface similar to the curved surface of a 5-cent coin. The glass shall be chemically clean and of the usual soda lime grade such as is used in non-corrosive microscope slides. The metal instrument shall be approximately the same hardness as the 5-cent coin. One hundred double strokes shall be made. A thrust of 16 ounces shall be applied during the test. A control test of the metal instrument and glass shall be made using a lubricant such as Glycerine, Petroleum Jelly, or a known non-abrasive paste. Make this control test on the glass near the spot where the primary test was made. After both tests are completed, place the glass in hot Nitric Acid to remove particles of alloy adhering to the glass. View the glass in transmitted and reflected light without the use of a microscope. If the tooth paste test shows more scratching on the glass than does the control test, repeat the test to eliminate the possibility of accidental defective spots in the glass surface. If the repeat test shows excessive scratching by the toothpaste, the tooth paste shall be rejected.

P-3—PEPSODENT DENTIFRICE ABRASION TEST

It will be seen (Fig. 44) that the machine is equipped with six individual cups, three on the left and three on the right. There is a separate metal brush holder and brush for each cup. Fig. 45 shows that clearly. Examination of the machine itself will quickly divulge its manner of operation obviating description. However, there are some instructions in this connection that are of great importance.

Setting Up Machine, Etc.

Always place machine on a strong, steady table or work bench to prevent unnecessary vibration when running. Using the level (1) as a guide, level machine and make it rigid in its position by using the adjustment screws (2).

It will be noted that the cups are numbered consecutively from one to six, and that a corresponding number is present opposite each cup on the base of the machine. The cups should always be placed on the machine in those positions, always making certain that their bottom surfaces are in complete contact with the base of the machine. Cups should always be removed from the machine by hand, never using anything to pry them loose, as such efforts will mar the surface of the machine base, thereby interfering with the proper seating of the cups.

To remove the brush holders from the machine, merely

loosen set-screws (3). It will be noted that all brush holders are numbered to correspond to the numbers of the cups. They should always be placed on the machine in that position. In placing the brush holders on the machine be sure to shove the arm as far as it will go into the head containing set-screw (3). Always be sure that those arms are securely fastened by tightening the set-screws (3).

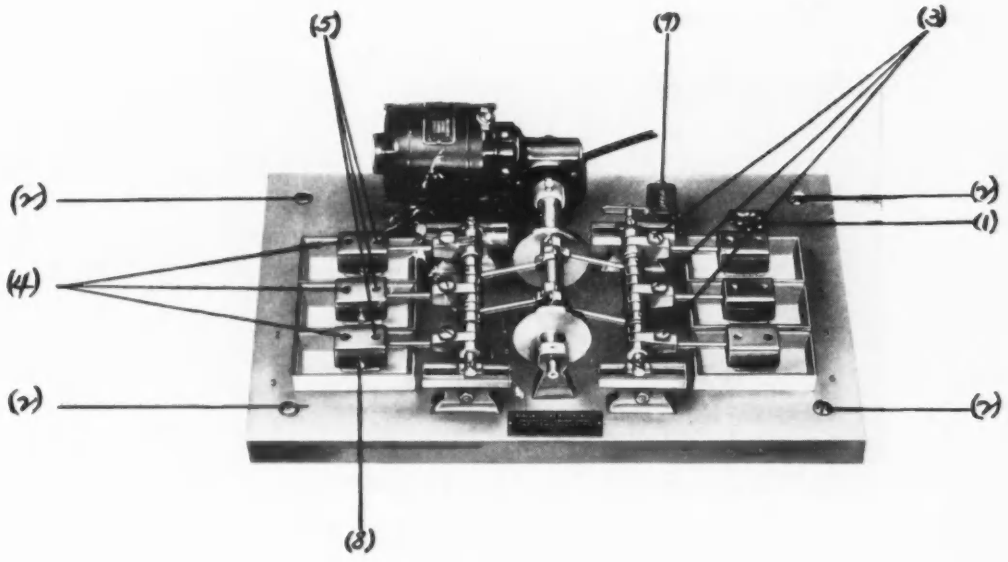


Figure 44. Full view of Pepsodent abrasion testing machine

The machine will be received with brushes already mounted in the brush holder. Brushes are centered in the holders and anchored by tightening the set-screw which is just below the opening (4). A small bar wrench is furnished for that purpose. Care must be taken not to tighten the set-screw too much, as it may warp the brush and destroy the combined level plane of the bristle ends. We should call your attention here to the fact that the bristle ends of the brushes have been leveled so that their combined surfaces form a complete, level plane. This was done to insure as complete as possible contact of the bristles with the copper test-plates on which the abrasion test is run.

Preparation For An Abrasion Test

1. Using a good grade of lubricating oil, oil motor and other portions of machine where provision is made for oiling.
2. Free each copper testing plate of surface uncleanliness such as oil or water by dipping them up and down, first in alcohol and then in ether. Use the smooth face pliers for holding the plates during this operation, so as to avoid scratching the plates. Also, avoid scraping the plates against the neck of the bottle.
3. Weigh the plates to the 4th decimal point in grams.
4. Transfer the copper plates to their respective metal cups. Since the plates and cups are numbered similarly, it is well, in order to avoid confusion in records, to place the plates in the cups having a corresponding number. For ease of access, it is best to remove the cups from the machine while placing and fixing the copper plates in the bottoms of the cups. Center the plates in the bottoms of the cups with respect to the inner sides and ends of the cups. Since the plates have rounded corners it will be seen that there is an open space in the region of these corners. Into these areas, with a medicine dropper, drop a small quantity of melted Parawax. Then, with a hot spatula, carefully seal the ends of the plates to the bottoms of the cups. Avoid carrying or dropping any Parawax onto the upper surface of the plates. If Parawax does accidentally get on that surface it should be removed as it would interfere with the accuracy of the test.

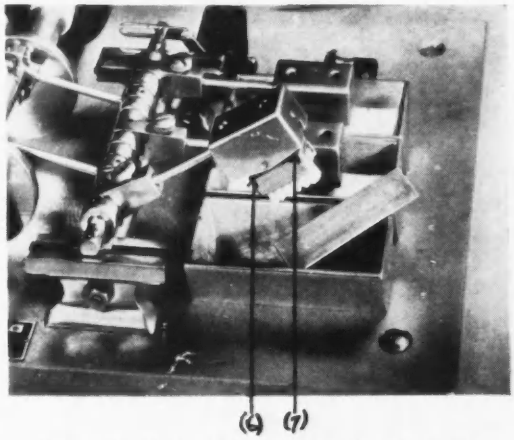


Figure 45. Close-up view of one-half of Pepsodent abrasion testing machine, showing metal cups, metal brush holder with brush, and one copper testing plate.

5. After the copper testing plates are sealed in their cups, the cups are replaced on the machine as per previous instructions.

6. The brush holders with their brushes having been properly attached to the machine, the next step is to adjust the brushes into as near perfect contact with the copper testing plates as it is possible. The following procedure is for that purpose: Place one of the plain paper strips [received with the machine] in the bottom of No. 1 cup. On top of that paper strip place one of the strips of carbon paper. Now, lower No. 1 brush to within about $\frac{1}{8}$ in. of the copper plate in the bottom of the cup and allow it to drop from that point. Raise the brush up out of the cup and examine the strip of paper to see whether or not the bristle-end contact has left an imprint from the carbon paper that shows even contact of the bristles throughout. Intensity of imprint is of great importance when determining even contact. For example, if the recording of bristle contact is quite heavy in one area and light in another, this would be evidence of uneven contact. When all areas of the imprint show the same intensity of recording, the contact may be assumed to be even throughout. [There is one exception to this rule, if the brush has been dropped from a point too high above the copper plate, enough bend occurs in some of the bristles to allow all of the bristles to register contact. This would permit an otherwise imperfect contact of bristles to be recorded as perfect or satisfactory]. Should the imprint record on the white strip of paper indicate incomplete or uneven contact of the bristles it will be necessary to carefully adjust the tilt of the brush to correct that condition, continuing to check with the carbon paper and a fresh strip of plain paper after each such adjustment. Lateral tilt of the brush is accomplished by grasping the brush-holder head and forcefully *rotating* it laterally on its arm. It is not necessary to loosen set-screw (5) to accomplish this. To regulate the longitudinal tilt of the brush, place a screw driver between the actual brush holder and the brush holder head proper, and with a rotating-prying movement of the screw driver move the actual brush holder to the tilt thought necessary. This prying is done from the side and not from the end of the brush holder. The numbers (6) and (7) indicate the points at which the screw driver may be inserted for this operation. When No. 1 brush has finally been adjusted so that it produces a satisfactory contact imprint on the paper strip, follow the above procedure for adjusting the remaining brushes. [It might be added that it is seldom necessary to loosen set-screw (8) to accomplish longitudinal tilting of the brush. However, it may be found necessary to tighten that set-screw or set-screw (5) to keep the brush from tilting during an abrasion test. A bar wrench is furnished for use on (5) set-screw].

7. Now that the brushes have all been adjusted and lifted up out of the cups, the next step will be the preparation of the dentifrice or polishing agents to be tested. This is done by weighing up a definite quantity of toothpaste, toothpowder or polishing agent, then adding a definite quantity of distilled water and stirring until a thorough mixture is produced. When testing materials in powder form, the following proportions are used for *each* cup:

Powder	10 grams
Distilled Water	20 cc.

When testing materials that are in paste form, the following proportions are used:

Paste	20 grams
Distilled Water	10 cc.

The materials to be tested are best weighed in beakers. The water may be added and the mixing completed in the beakers. It is then a simple matter to pour the mixtures from the beakers into their respective cups on the machine.

8. Having checked the stroke recorder (9) to be sure that it is set at zero, the brushes are carefully lowered into the cups and the machine is set in motion. It is allowed to run until the recorder registers 50,000. Since the recorder registers every other single stroke of the brushes, this figure really represents a total of 100,000 single strokes. About $5\frac{1}{2}$ hours of running time are required to register the 50,000 on the recorder.

9. When the recorder reaches the above figure the machine is stopped. The brush holders with their brushes and cups with their contained mixtures are now removed from the machine and carried over to the sink where they may be cleaned under running water. A large test tube brush will aid materially in the cleansing or freeing the cups and brushes of the test mixtures. In the case of the brushes, they should be given special attention to make certain they are completely clean so as to avoid contamination of any future test. After the cups have been thoroughly cleansed under cold running water, using laboratory tongs to hold them, they are now held under a stream of hot running water to melt and carry the Parawax away. Continue to hold the cup under the stream of water until all the Parawax is washed out and off the copper test-plate. Remove the test plate and dry carefully with a clean, soft towel or cloth. Continue this procedure for all the cups and test-plates. Of course, the cups and brush holders with their brushes are also wiped dry. The brushes are allowed to dry thoroughly before they should be used in another test. Before they are used again, the dry brushes should be freed of any remaining polishing agent. This is done by running the finger over the ends of the bristles causing them to bend and snap back into position, which will dislodge adhering particles. Follow this by blowing a strong stream of compressed air over the brush to carry the particles away.

10. The copper testing plates have been washed off and dried, their cleansing is completed by dipping them into the alcohol and ether as was done originally. They are now ready to be reweighed to determine any loss in weight that may have taken place. The final weights are subtracted from the original weights, and the resulting figure is the loss that occurred. That figure is chosen to be called the "abrasion factor." It represents the *abrasive capacity* of the product that was tested.

To make additional abrasion tests repeat each step in the procedure as outlined above. Much of the success in

results *will depend on careful technique.*

P-4—THE ABRASIVE POWER OF TOOTHPASTES

K. W. Ray and H. C. Chaden
(Dental Cosmos **75**, *1070, 1933)*

The apparatus used in the main investigation was the same as that used by the *Victor Chemical Works* in their work on the study of dentifrice abrasives. (See also P-6.)

Specimens for the loss in weight tests to show the abrasive power of the toothpastes on the soft parts of the teeth were of cast antimony, of an approximate Brinell hardness of 64 and a microhardness of 250 as determined by the Spencer micro-character apparatus.

Each antimony block was ground and polished on all six sides until it was approximately ½ in. by ¼ in. by ⅜ in. The specimen was then carefully washed, first in water, then alcohol, and finally thoroughly dried. It was then weighed and mounted in the apparatus. Fifteen grams of the toothpaste to be tested were squeezed from the tube onto the paraffin disk and enough water added to give the water-paste ratio for the standard consistency. The consistency chosen was that at which the toothpaste flowed freely in a continuous stream from the scraper and spreader. While somewhat unscientific, this method of judging the consistency was quite accurate, and could be duplicated and checked repeatedly with ease. This fluid consistency was probably somewhat comparable to that of toothpaste when used on the teeth. The path left on the paraffin disk by the metal specimen was uniform for all the toothpastes tested, and consisted of a very thin layer of abrasive lying on the surface of the disk. The tests of each toothpaste used were made in two parts, of 2500 revolutions each (equal to a total of about one mile of sliding), and the losses in weight determined.

P-5—ABRASIVENESS OF DENTIFRICE MATERIALS

(R. W. Smith, Ind. & Eng. Chem. **12**, *419, 1940)*

The machine shown in figures 46 and 47 was developed by Smith for testing calcium carbonate. It was found to be useful for testing various dentifrices as well. Silver blocks (Bierbaum hardness 200) or antimony blocks (Bierbaum hardness 231) are weighed to 0.1 mg accuracy.

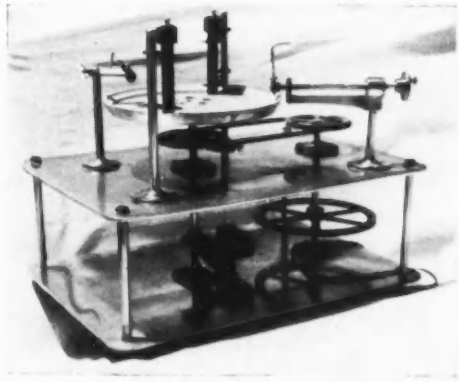


Figure 46. View from above showing abrasion machine only. Cutting tool and spreader show clearly in this picture.

The metal blocks are caused to rub uniformly under a weight of 83 grams, over a wax surface (consisting of 80 per cent paraffin and 20 per cent carnauba wax) coated with a slurry of 30 grams of powder and enough water to give the desired consistency. (Variation in slurry consistency does not visibly change the results.) The blocks are weighed after each 2000 revolutions but the test is allowed to run for 6000 revolutions when it is considered complete. Abrasion loss is noted in milligrams.

More recently, the wax surface has been replaced with a removable glass plate, made from ordinary double strength window glass, suitably cut to fit the pan. The glass surface is considered to be more sensative in making abrasion tests than the wax surface.

P-6—ABRASIVENESS & SCRATCHING—VICTOR METHOD

(J. Am. Dent. Assoc. **21**, *149-154, 1934)*

The abrasiveness is determined against a highly polished silver surface (2.7 Moh's scale, 96 Bierbaum units) made to rotate against a paste substance under test with glycerite of starch in such manner that the only variable is the abrasiveness of the material being examined and under a weight of 100 gm. at 2000 revolutions on a test machine; (figure 48) no loss in weight (0.0000 gm.) should be noted. The silver test piece should not be visibly scratched when viewed under a metallographic microscope and photographed after 100 revolutions under a weight of 150 gm.

AUTHOR'S NOTE—*Pastes or powdered dentifrices made with precipitated chalk and soap tend to form agglomerates resulting in greater abrasion than when chalk is tested alone.*

P-7—ABRASIVE TEST ON TEETH

(H. N. Wright and E. L. Fenske, J. Am. Dent. Assoc. **24**, *1889-1895, 1937)*

The determinations of the abrasiveness of the various substances were made on freshly extracted human teeth from all age groups of both sexes. Immediately after extraction, all teeth were placed in a 10 per cent formalin solution. All tests were made on noncarious tooth structures.

Tests were made with each abrasive, using an antimony block of Brinell hardness 64, in order to furnish a means of comparison of the abrasion on the metal block with the abrasion on the various structures of the teeth.

The apparatus used was that previously described by Ray and Chaden (P-4). The teeth were mounted on the arm of the apparatus and cut in a special manner. These methods of cutting and mounting the teeth were used in order to bring the proper portion of the tooth structure in contact with the abrasive and in such a way that the axis of the structure was perpendicular to the plane of the revolving disk carrying the abrasive.

Each tooth was measured before and after the test with a micrometer graduated to 0.01 mm. All readings of the micrometer were made in triplicate. A constant load of 100 gm. was maintained on the tooth. A load of this magnitude was also used by Ray and Chaden; and we found it to be the most satisfactory through trial and error, lighter loads causing uneven "riding" of the tooth and heavier loads causing the tooth to cut into the wax

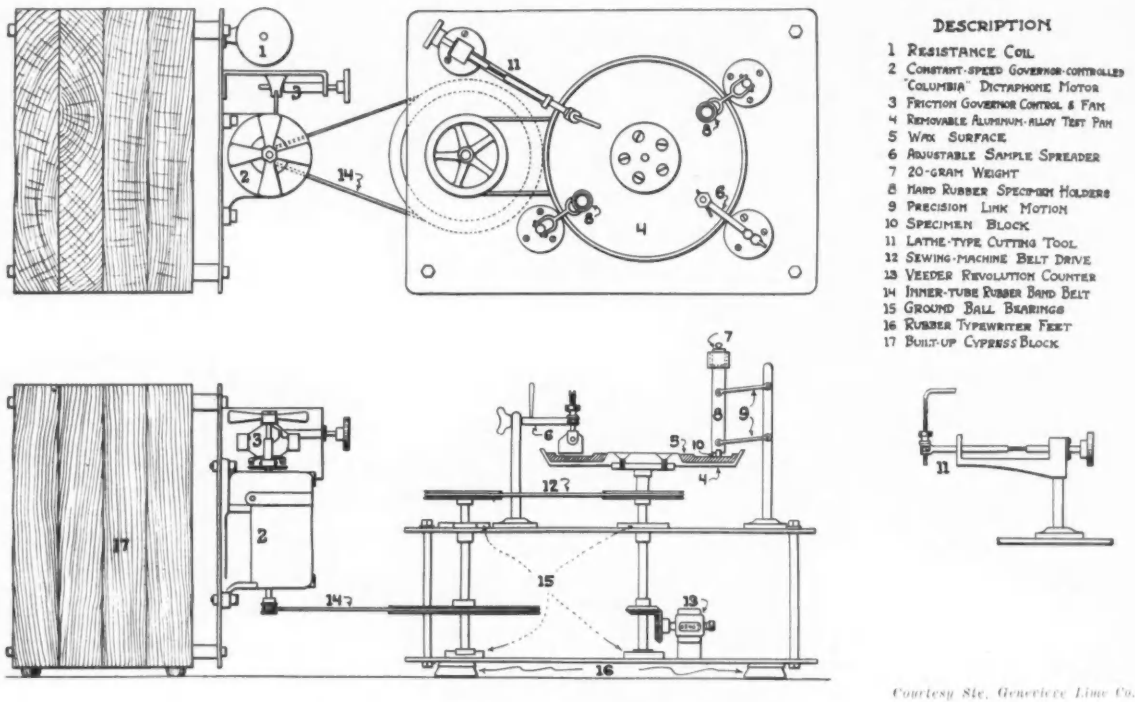
disk carrying the abrasive. The wax disk consisted of a mixture of paraffin and carnauba wax, the proportions of which were varied with the temperature.

By the addition of water, the abrasives were made into a paste of a consistency that gave a satisfactory "flow" and "spreading" on the disk. Water was added from time to time during the course of a test in order to keep the consistency of the abrasive as nearly constant as possible.

Ten thousand revolutions of the disk were used for determination of the wear on the antimony block and enamel; whereas, for the softer structures, namely the dentin and cemento-enamel junction, 5000 revolutions were used.

Control tests on all three of the tooth structures studied showed that no abrasion was caused by 10,000 revolutions of the wax disk in the absence of any abrasive. No loss in weight of the antimony block occurred under similar conditions.

AUTHOR'S NOTE—*Difference in moisture content of tooth specimen is a major variable and greatly influences accurate weighing of tested teeth.*


DESCRIPTION
1 RESISTANCE COIL
2 CONSTANT-SPEED GOVERNOR-CONTROLLED "COLUMBIA" DICTAPHONE MOTOR
3 FRICTION GOVERNOR CONTROL & FAN
4 REMOVABLE ALUMINUM-ALLOY TEST PAN
5 WAX SURFACE
6 ADJUSTABLE SAMPLE SPREADER
7 20-GRAM WEIGHT
8 HARD RUBBER SPECIMEN HOLDERS
9 PRECISION LINK MOTION
10 SPECIMEN BLOCK
11 LATHE-TYPE CUTTING TOOL
12 SEWING-MACHINE BELT DRIVE
13 VEEDER REVOLUTION COUNTER
14 INNER-TUBE RUBBER BAND BELT
15 GROUND BALL BEARINGS
16 RUBBER TYPEWRITER FEET
17 BUILT-UP CYPRESS BLOCK

Courtesy Ste. Genevieve Lime Co.

Figure 47. Smith's machine for testing dentifrice abrasion

P-8—ABSORPTION

"Snow Top Chalk" Method

Absorption is one of the most important properties of precipitated chalk used in dentifrice formulas. This property must be carefully controlled and maintained at a constant value that is suitable for the particular formula in which the chalk is used. A constant and accurate control on the absorption of every shipment should be maintained.

The test devised to show the varying degrees of absorbency is based on taking 15 gm. of the material to be tested in a Nessler tube 20 mm. in diameter by 250 mm. in length. Distilled water is added from a burette and incorporated with the chalk until the point is reached where the slurry will move readily on shaking vigorously, causing a rattling sound. This is known as the *rattle point*, and is recorded in cubic centimeters of water. On further addition of water with intermittent shaking, a point is reached where the slurry will flow down the tube when inverted at an angle of 60° to the horizontal. This is known as the *flow point*, and is also measured in cubic centimeters of water.

P-9—ALCOHOL DETERMINATION

U.S.P. for Alcohol Content of 30% or less

GENERAL PROCESS—Measure accurately not less than 25 cc. of the liquid in which the alcohol is to be determined, and note its temperature. Transfer it to a suitable distilling apparatus and, if its alcohol content is thought to be not more than 30 per cent, dilute it with an equal volume of distilled water, using the water to rinse the vessel that was used for measuring unless this vessel is a graduated pipette which has been standardized on the basis of the amount delivered. Distil, and collect a volume of distillate of about 2 cc. less than the volume of the original test liquid, adjust to the temperature at which the original test liquid was measured, add sufficient distilled water to measure exactly the original volume of the test liquid and mix thoroughly. Determine the specific gravity of the liquid at 25°C. and from this result ascertain the percentage, by volume, of alcohol contained therein, see

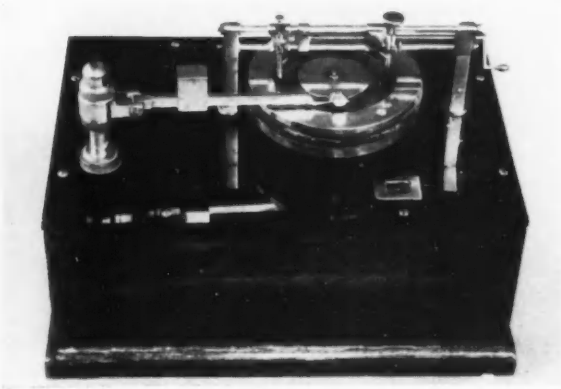


Figure 48. Victor Chemical Works toothpaste abrasion tester.

Alcoholometric Table, in the appendix. The proportion of alcohol by volume in the distillate equals that in the liquid examined.

For More Than 30 per cent Alcohol

If the liquid under examination contains more than 30 per cent of alcohol, proceed as directed above, except: dilute the sample with about twice its volume of distilled water and collect a volume of distillate about 2cc. less than twice the volume of the original test liquid, cool or bring to the temperature at which the original liquid was measured, add sufficient distilled water to measure exactly twice the original volume of the test liquid and determine its specific gravity. The proportion of alcohol by volume in this distillate, as ascertained from its specific gravity, equals one-half that in the liquid examined.

The distillate must be clear or only slightly cloudy, must not contain any non-volatile material and not more than traces of volatile substances other than alcohol and water.

This general method is suitable for examining most fluid extracts and tinctures, provided the capacity of the distilling flask is sufficient (commonly two to four times the volume of the liquid to be distilled) and the rate of distillation is such that clear distillates are produced. Some alcoholic preparations will, however, require special treatment or the observance of special precautions to yield suitable distillates. All distillates must be clear or nearly so. If cloudy, they may be clarified by agitation with purived talc, or with precipitated calcium carbonate, and filtered, after which the temperature of the filtrate is adjusted and the alcohol determined by specific gravity. All of this should under conditions that will minimize the loss of alcohol by evaporation.

Frothing—Liquids which froth to a troublesome extent during distillation may be distilled by strongly acidulating them with phosphoric or sulfuric acid, or by the addition of a slight excess of calcium chloride solution, or by the addition of a little paraffin or yellow wax to the distilling flask.

Bumping—Liquids that tend to bump badly when heated (particularly resinous solutions) may be distilled by making them alkaline with magnesia magma or by placing pieces of pumice, glass beads, or similar materials in the distilling flask with the liquid, or by similar means of distributing the heat.

Glycerine—Liquids that contain glycerine must be diluted with sufficient distilled water so that the residue, after distillation will contain at least 50 per cent of water.

Iodine—All solutions of iodine must be deprived of free iodine, before being distilled, by treatment with powdered zinc, or by the addition of just sufficient solution of sodium thiosulfate followed by a few drops of sodium hydroxide T.S. to fix volatile sulfur compounds.

Volatile Substances—Spirits, elixirs, tinctures, etc. (shaving lotions, toilet water, etc.) that contain appreciable proportions of volatile materials other than alcohol and water, such as volatile oils, chloroform, ether, camphor, etc., are treated as follows: Mix the accurately measured liquid with about an equal volume of saturated solution of sodium chloride in a separator, then add a volume of purified benzin equal to the sample, and shake the mixture to extract the interfering volatile ingredients. Draw off the separated lower layer, and extract the benzin solution with two successive portions of a saturated solution of sodium chloride, using about one-half as much each time as was used in the first extraction mixture. Combine the aqueous saline solutions, and distil the mixture in the usual way, collecting a volume of distillate having a simple ratio to the volume of the original liquid.

If a troublesome emulsion develops in the liquid mixture when shaken with the benzin, dilute a fresh portion of the original liquid with water and distil it as directed in the general process. Then treat this distillate as directed above, using purified benzin and sodium chloride solution, and distil the aqueous saline solution so produced to obtain a distillate which is free from volatile substances other than alcohol and water.

In preparing collodion for distillation, use water in place of the saturated solution of sodium chloride directed above.

If volatile oils are present in small proportions only, and a cloudy distillate is obtained, the benzin treatment not having been employed, the distillate may be clarified and rendered suitable for the specific gravity determination by shaking it with about one-fifth its volume of purified benzin, or by filtering it through a thin layer of purified talc.

OTHER PREPARATIONS

REQUIRING SPECIAL TREATMENT

Preparations containing free ammonia, as aromatic spirit of ammonia, must be rendered slightly acid with sulfuric acid before being distilled.

Spirit of glyceryl trinitrate must be treated with a small excess of sodium hydroxide before being distilled.

Chloroform liniment, camphor and soap liniment, and liniment of soft soap are treated with an excess of sulfuric acid to effect decomposition of the soap before they are extracted with purified benzin as directed in the general process.

P-10—ALCOHOL CONTENT EASILY AND QUICKLY DETERMINED

Williams Improved Method

A compact, pocket-size, test set for the rapid determination of alcohol content and the presence of caramel in distilled spirits containing 25 per cent to 64 per cent alcohol. with an accuracy within 0.5 per cent. The test requires 7.5 ml of sample and the time required for a determination is about two minutes.

Figure 49. Fisher-Williams Improved Alcohol Tester.

1st—Readings not affected by presence of glycerine or sugar up to 10 per cent.

2nd—Readings not affected by temperature within a range of 70° to 85°F.

3rd—Presence of caramel or other artificial coloring indicated by this test.

Technique. The tube is filled to the 7.5-ml mark with the sample. Williams Reagent is added to the 15 ml mark. The tube should be stoppered and inverted about ten times and held vertically until the separation of reagent and sample is complete. The reagent meniscus is then read off the tube graduations giving the readings directly in per cent alcohol.

The Fisher Williams Alcohol Test Set consists of a leatherette carrying case 9¼ x 2⅛ inches, a graduated tube with rubber stopper, a 4-oz. bottle of reagent, a pipette with rubber bulb, three strips of absorbent paper and full directions.

P-11—ANTISEPTIC TEST

Official Methods of the U. S. Food & Drug Administration U. S. Department of Agriculture. (Taken from Circular 198)

Only selected portions of the "Methods" are given here. For complete information on all methods of testing all kinds of antiseptics and germicides, obtain a copy of Circular 198 (1931) from the U. S. Department of Agriculture, Washington 25, D. C.

METHOD APPLICABLE IN A GIVEN CASE

Substance	*Method Applicable*
Soluble disinfectants:	
A. Preparations for general use.	Phenol coefficient—*E. typhi* at 20°C.
B. Preparations for antiseptic use.	Phenol coefficient technic—*S. aureus* 20°C. or 37°C. as outlined.
C. Preparations for surgical use.	Phenol coefficient technic—*S. aureus* 20°C.
Insoluble and concentrated disinfectants:	
A. Preparations for general use (oils, tarry substances, powders, lime, etc.).	Wet filter paper—*E. typhi* and *S. aureus.* Room temperature.
B. Preparations for use on dry surfaces (spraying oils, sweeping compounds, powders, lime).	Dried filter paper—*S. aureus.* Room temperature.
C. Preparations for fumigation (filter paper and exposed to gas in confined space).	Wet filter paper—*E. typhi* and *S. aureus;* room temperature. Dried filter paper—*S. aureus;* room temperature. (Extension of time may be indicated).
Soluble and liquid antiseptics:	
A. Preparations to be applied for a short time (washes, mouth washes, gargles, douches, etc.).	Phenol coefficient technic—*S. aureus* 20°C. or 37°C. as indicated.
B. Preparations for use on open wounds, etc. (washes).	Phenol coefficient technic—*S. aureus* 20°C or 37°C. as indicated. (Tested in presence of 10 per cent serum.)
C. Preparations remaining on site of application (dyes, wet dressings, rubbing preparations, etc.).	Agar cup-plate.
D. Preparations for use on open wounds, etc. (dyes, wet dressings, etc.).	Serum agar cup-plate.
E. Preparations remaining on site of application but claiming germicidal properties.	Wet filter paper—*S. aureus* 37°C. Extension of time may be indicated.
Solid soluble antiseptics:	
A. Lozenges, tablets, etc.	Wet filter paper—*S. aureus* 20°C. or 37°C. as indicated. Note: Saturated aqueous solution or in dilution indicated.

Insoluble and concentrated antiseptics:

A. Preparations remaining on site of application (dusting powders, ointments, salves, suppositories, plasters, dressings, etc.).

B. Preparations remaining on site of application but claiming germicidal properties.

C. Preparations for use on open wounds, etc.

Agar plate.

Antiseptic materials, appliances, etc.:

A. Bandages, dressings, catgut, etc.

B. Tape, pads, etc.

Wet filter paper—*S. aureus* 37°C. Extension of time may be indicated.

Solid and semisolid antiseptics:

A. Preparations used for a short time (soaps, soap powders, toothpastes, tooth powders, etc.).

Serum agar plate.

Disinfectants and antiseptics for use in the absence of organic matter:

A. Preparations for drinking water.

Serum agar plate.

Agar plate.

Wet filter paper—*S. aureus* 20°C. or 37°C. as indicated. (Note: Undiluted and diluted with equal parts water or diluted with sufficient water to form a thick paste or heavy emulsion.)

Phenol coefficient technic—*E. typhi* 20°C. (Note: 0.1 cc. of culture to 10 cc. of diluted preparation.)

FOOD AND DRUG ADMINISTRATION METHOD

The test organism is a 22-26 hour culture of *Eberthella typhi* (Hopkins strain) incubated and grown in nutrient broth at 37°C. The broth contains the following ingredients: 5 gm. of Liebig's beef extract, 5 gm. of chemically pure sodium chloride, and 10 gm. of Armour's peptone (for disinfectant testing) in 1,000 cc. of distilled water. The mixture is boiled for 20 minutes, made up to original weight (or volume) with distilled water, and adjusted with NaOH to pH 6.8 using the colorimetric method. It is then filtered through paper, tubed (10 cc. to each tube), and the tubes plugged with cotton and sterilized at 15 pounds pressure for 40 minutes. The test culture is transferred daily in this medium for not more than one month. At the end of each month, a fresh transfer is made from the stock culture. The stock culture is carried on agar slants of the same composition as the broth medium plus 1½ per cent Bacto-Agar (Difco), adjusted to pH 7.2 to 7.4. This medium is also filtered, tubed, plugged with cotton, sterilized, and slanted. The stock culture is transferred once a month, and the test organism is taken from the month-old stock culture. When the test organism has not been transferred daily, it is advisable to make four or five consecutive daily transfers in broth before using it for testing purposes, to be reasonably sure of its conforming to the phenol resistance requirements. When only one transfer has been skipped the following transfer from the 48-hour culture is usually satisfactory for use after 24 hours. Transfers are made with the platinum loop used in the test. Only cultures giving readings within the following limits are considered satisfactory:

Phenol	5 min.	10 min.	15 min.
1-90	+	+	0
1-100	+	+	+
or			
1-90	0	0	0
1-100	+	+	+

The following reading is that most usually obtained and is the most convenient:

Phenol	5 min.	10 min.	15 min.
1-90	+	0	0
1-100	+	+	+

Wherever any expression of phenol coefficient occurs in literature, on labels, etc., it is assumed to mean the *E. typhi* phenol coefficient, unless otherwise stated. It is, however, the distinct intention of this department not to limit the test to the use of one organism. In fact, the test has been found adaptable to the use of a wide variety of bacterial species in the determination of phenol coefficients. In cases where some of the more strictly parasitic bacteria are used, modifications in media are necessitated, and, of course, a change in the phenol dilutions. The writers are not in a position at this time to prescribe the limits of resistance for many of the organisms that might be used. Therefore discussion of the exact technic is here omitted, with the exception of that for *Staphylococcus aureus*. Suggestions for the use of certain representative types may, however, be found in a paper by Reddish (Am. J. Pub. Health, **17**, 320). When any test organism other than *E. typhi* is used it should be distinctly designated when stating the phenol coefficient.

S. aureus has been found to be an extremely useful organism for testing disinfectants and antiseptics and has been used for this purpose for a number of years. When substituted in the above test the technic remains exactly the same. The phenol dilutions, however, must be changed. The resistance of any strain of *S. aureus* used in this test must come within the following limits: At 20°C. it must survive a 1-60 dilution of phenol for 5 minutes and a 1-70 dilution for 15 minutes. The following is the minimal resistance that would be acceptable:

Phenol	5 min.	10 min.	15 min.
1-60	+	0	0
1-70	+	+	+

S. aureus, due to its ubiquity, resistance and ever-ready tendency to cause infection, should always be employed in testing those substances recommended for personal use or as applications for wounds. If the disinfectant is recommended for use externally the temperature of the test should be 20°C., but where such substances are recommended for use in the body cavities, such as for mouth washes, gargles, douches, etc., this test should be conducted at 37°C. In such case the test should be designated "The F. D. A. method (special) *S. aureus*, 37°C." At body temperature the *S. aureus* should show the following resistance to phenol:

	5 min.	10 min.	15 min.
1-80	+	0	0
1-90	+	+	+

or

	5 min.	10 min.	15 min.
1-80	+	0	0
1-90	+	+	0

The previous description of this method by Reddish differed from this only in allowing a slightly wider latitude in the resistance of the test organism against phenol.

Foot Note: According to current usage the word "antiseptic" has two meanings; to kill bacteria or to prevent their growth, depending upon the use of the product. Products such as salves, ointments, and dressings that remain in contact with the body for long periods of time, may be designated properly as antiseptics if they inhibit the growth of bacteria. On the other hand, mouth washes, douches, gargles, and preparations of like nature are in contact with the body for but brief periods of time and exert negligible inhibitory action. These may be described properly as antiseptics only if they will destroy bacteria under the conditions of use; that is, in the dilutions recommended and in a period of time comparable to that in which they would have an opportunity to act when used as directed.

OTHER METHODS

The limitations of the phenol coefficient make it necessary in some cases to judge the germicidal preparation by other tests or by additional tests. This is particularly true of preparations that are not completely soluble or miscible in water. It is also true of certain preparations designated as antiseptics.

Soluble antiseptics or antiseptics completely miscible with water can be tested, of course, by the procedure described as the F. D. A. *Staphylococcus aureus* phenol coefficient method. In the testing of these substances, however, the phenol coefficient is not obtained necessarily, the phenol figure being used merely as a check of the resistance of the test organism. The information desired is the concentration which will kill in five minutes.

In an effort to stimulate practical conditions, it is frequently advisable to conduct the tests in the presence of blood serum. Sterile horse serum in a concentration of 10 per cent is ordinarily used, both in the germicidal and inhibitory tests. Special claims and uses of a product, however, frequently indicate the desirability of a higher concentration of this organic enrichment.

The following methods designed for the testing of insoluble and immiscible products are in use in this laboratory at the present time. Some of them have been used for years and have been described previously in *J. Lab. & Clin. Med.* **14**, 649. Laboratory tests, of course, cannot duplicate the exact conditions found in practice. The procedures here outlined, however, are as close an approach to practical conditions as is feasible in routine laboratory tests, and reveal the obviously useless preparations. It should be noted that inhibitory tests are considered along with other facts in interpreting whether or not the substance will be of value in practical use. It must be remembered that not only bacteriological but physiological and pharmacological facts frequently must be taken into consideration in judging many substances.

THE WET FILTER-PAPER METHOD

The wet filter-paper method is a germicidal test rather than a test of inhibitory properties. It is used when the substance to be tested is not soluble or completely miscible with water, or for substances that are to be used in high concentration, such as soaps, toothpastes, suppositories, dyes, dusting powders, salves, and ointments. If the substance is to be used in the body cavities the test is carried out at 37°C.; if not, the test is carried out at 20°, or at room temperatures, and the temperature is recorded.

No. 2 Whatman filter paper is cut into pieces about 0.5 cm. square, and sterilized in a plugged test tube at temperatures below 170°C. to prevent charring. A suitable number of the paper squares are then impregnated with *Staphylococcus aureus*, or other test organisms, by immersion in a 24-hour broth culture of the organism. The culture must have the standard resistance required for phenol coefficient testing. The wet inoculated squares are then placed in the liquid or solid substance to be tested in such a way as to be completely covered and in intimate contact. At the end of 5 minutes, 10 minutes, 15 minutes, or 1 hour, or any other desired length of time, the wet papers are removed with a sterilized, stiff, platinum wire bent at a sharp angle to form a hook and placed in 10 cc. of sterile broth. After as much of the disinfectant as possible has been removed (in the case of sticky substances, the needle must be used to aid in freeing the squares of adherent germicide) the squares are retransferred to a fresh tube of sterile broth (10 cc.) and the tubes incubated at 37° for 48 hours, when they are observed for evidence of growth.

It will be noted that in this test resubcultures are always required, since the first tube of broth to which the filter-paper squares have been added frequently contains sufficient antiseptic to exhibit inhibition of growth. Both tubes of broth are usually incubated.

(Chapter IV continues in subsequent issue)